A MANUAL

OF

BRITISH

BUTTERFLIES AND MOTHS.

BY

H. T. STAINTON,

EDITOR OF 'THE ENTOMOLOGIST'S ANNUAL.'

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(COMPRISING THE BUTTERFLIES AND STOUT-BODIED MOTHS).

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PREFACE.

THE object of this work is to supply, in a small compass and for a low price, the greatest possible amount of information likely to be useful to beginners in the pursuit of Butterflies and Moths.

For this purpose the descriptions have been carefully made from actual specimens, regard being paid only to the most prominent characters of the insects.

Long descriptions and minute hair-splittings would have been misplaced in an elementary work like this.

Synonymy is also omitted, as, to those who take this as their first book, it would be of little use, and would at the same time have given that learned look which repels rather than invites the uninitiated.

In the Appendix will be found a synonymic list, collating the names here used with those employed in Mr. Henry Doubleday's 'List of British Lepidoptera' and the 'Catalogue of British Lepidoptera

in the Collection of the British Museum,' prepared by the late Mr. J. F. Stephens.

English names are given only where they are in general use. To have raked up all the fantastic names by which some have thought to facilitate the study of 'Mothology Made Easy,' would have been to have pandered to a prejudice, and perpetuated a 'popular superstition.' Those who collect insects, and who do not wish to be utterly isolated, must learn to call them by names by which *other people* will know them.

With the view of compressing information, a number of abbreviations have been used; but a little patience and trouble will soon enable any one to interpret them with ease.

At the commencement of each Family some general observations on the habits of the species, and localities they frequent, are given; and the most abundant species are indicated as those likely first to fall into the hands of the young collector.

H. T. STAINTON.

Mountsfield, Lewisham, S.E.,
February, 1857.

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ERRATA.

P. 18, l. 23, for "*greyish*" read "*greenish*." (This is corrected in some impressions).

P. 137, l. 6, for "On lichens, oaks," &c., read "On lichens on oaks," &c.

P. 147, l. 13, and p. 148, l. 1, for "Lubricepeda" read "Lubricipeda."

P. 148, l. 10, 11, for "not occurring in Scotland" read "not occurring in the North and East of Scotland." It is not uncommon in the West of Scotland.

P. 173, l. 10 from the bottom, for "beyond the middle" read "to beyond the middle."

P. 178, l. 3 from bottom, and p. 179, l. 3, for "DIPHTERA" read "DIPHTHERA."

P. 192, l. 4, for "*N. extrema*" read "*N. concolor*."

P. 193, l. 10, dele "In the Cambridgeshire fens."

P. 202, bottom line, for "limpid margin" read "hind-margin."

P. 254, l. 6 from bottom, for "is the least" read "is one of the least."

P. 285, l. 15, after "spotted with blue" read "On *Verbascum*, *Scrophularia*, &c. VI, VII."

P. 286, l. 2, after "spotted with black" read "On *Verbascum Lychnitis*."

P. 288, bottom line, for "*Heliodes heliaca*" read "*Heliodes Arbuti*."

EXPLANATION

OF THE

ABBREVIATIONS USED.

SIZE.

″, used to express inches; ‴, lines, a line being the twelfth part of an inch. Thus, 3″ 4‴—4″ 2‴ means that the insect varies in size from 3 inches 4 lines to 4 inches 2 lines.

SEXES.

♂ means male; ♀, female.

WINGS.

F.-w., fore-wing; h.-w., hind-wing; u. s., under side. Unless otherwise stated, the upper side of the insect is referred to in all cases.

TIMES OF APPEARANCE.

I, January; II, February; III, March; IV, April; V, May; VI, June; VII, July; VIII, August; IX, September; X, October; XI, November; XII, December.

b. m. e. beginning, middle and end of the month.

h. implies that the insect then appearing has hybernated.

s. implies that the insect only appears during that month *sometimes*.

LETTERS IN ITALICS,

placed between parentheses (), designate the name of the Author from whom the information in the preceding sentence is derived. The names in full explain themselves. The following are contractions:—

Boisdv. Boisduval.
Dup. Duponchel.
Hub. Hubner.
H. D. Henry Doubleday.
Och. Ochsenheimer.
Westw. Westwood.
Gu. Guenée.

LOCALITIES.

Be. Bembridge (Isle of Wight). Only used in the Butterflies.
Bi. Birkenhead, Cheshire.
Brm. Birmingham. Only used in the Butterflies.
Bl. Blandford. Only used in the Butterflies, *Sphingina* and *Bombycina*.
Brg. Brighton.
Brs. Bristol.
Bu. Burton-on-Trent.
Ca. Cambridge. Only used in the *Sphingina*, *Bombycina* and *Noctuina*.
Cr. Corsham, Wiltshire. Only used in the Butterflies.
Ct. Lower Guiting, on the Cotswold.
Da. Darlington.
Do. Dorchester. Only used in the Butterflies, *Sphingina* and *Bombycina*.
Ed. Edinburgh.
Ep. Epping. Only used in the Butterflies, *Sphingina* and *Bombycina*.
Ex. Exeter.
G. Glasgow. Only used in the Butterflies, *Sphingina* and *Bombycina*.
Ha. Halton, in Buckinghamshire.

Hu. Huddersfield.
I. Ireland. Only used in the Butterflies.
K. Kingsbury, Middlesex.
L.D. The Lake District of Cumberland and Westmoreland.
Lc. Leicester. Only used in the Butterflies, *Sphingina* and *Bombycina*.
Lw. Lewes.
Ly. Lyndhurst.
M. Manchester.
O. Oxford. Only used in the Butterflies and *Sphingina*.
Pm. Pembury, in Kent, near Tunbridge Wells.
Pt. Peterborough. Only used in the Butterflies.
Pl. Plymouth.
Pr. Preston. Only used in the Butterflies, *Sphingina* and *Bombycina*.
R. Ramsgate. Only used in the Butterflies, *Sphingina* and *Bombycina*.
Sc. Scarborough.
Sh. Shrewsbury.
St. Stowmarket.
Te. Teignmouth. Only used in the Butterflies, *Sphingina* and *Bombycina*.
Tn. Tenterden.
Tr. Truro.
Wa. Wavendon, near Newport Pagnel.
Wi. Winchester. Only used in the Butterflies, *Sphingina* and *Bombycina*.
Wr. Worcester.
Wt. Worthing.
Y. York.

Having correspondents resident in most of the above localities, a list of the species occurring in each was prepared; and hence these localities are continually cited; but this does not by any means imply that the species do not occur in other localities.

When any of these abbreviations of localities are in *Italics*, it signifies that the insect *has occurred* there, but is not found there every year. ! signifies that the species occurs there *commonly;* !!, that it is *abundant*. Either of these marks

after an abbreviation in *Italics* implies that the insect *has been* common or abundant.

EXPLANATION OF TECHNICAL TERMS.

Outline of Wing.

Costa, the front edge of each wing.
Base, the portion of the wing nearest the body.
Hind-margin, the edge furthest from the body.
Inner margin, the edge opposite the costa.
Tip, the part where the costa meets the hind-margin.
Anal angle, where the hind-margin meets the inner margin.

Markings.

Longitudinal, extending in the direction from the base to the hind-margin of the wing, or from the head to the tail of the insect.
Transverse, extending from the costa to the inner margin of the wing, or from one side of the body of the insect to the other.
Patch, blotch, an irregularly shaped marking, of moderate or large size.
Spot, a regularly shaped marking, of moderate size.
Dot, a minute round spot.
Band, a transverse marking, wider than a line and of uniform width.
Line, a fine thread-like marking, of uniform width.
Streak, stripe, an elongated marking, not necessarily of uniform width.

The following terms apply to the markings on the fore-wings of the NOCTUINA, and will be found fully explained at pp. 170 and 171.

stigmata,	abbreviated	stig.
claviform stigma,	,,	clav. st.
orbicular stigma,	,,	orb. st.
reniform stigma,	,,	ren. st.
elbowed line,	,,	el. l.
half-line,	,,	h. l.

inner line,	abbreviated	i. l.
subterminal line,	,,	subt. l.
central shade,	,,	cen. sh.

Anal, of or belonging to the tail, or that end of the body opposite to the head.
Anal angle, see *Outline of Wing*.
Anterior, that which is in front or nearest to the head.
Attenuated, becoming more slender.
Band, see *Markings*.
Base, see *Outline of Wing*.
Before the middle, between the middle and the base of the wing.
Behind, beyond the middle, between the middle and the hind-margin of the wing.
Blotch, see *Markings*.
Cilia or fringe, the long scales projecting beyond the hind-margin of the wing.
Concave, that which is hollowed out, as the inner margin of the hind-wings of *P. Machaon*.
Convex, curved, the curve projecting outwards, as in the costa of the fore-wings of *P. Machaon*.
Congener, a species in the same genus with another.
Costa, see *Outline of Wing*.
Denticulated or toothed, as in the hind-margin of the hind-wing of *P. Machaon*.
Dorsal, of or belonging to the back.
Dot, see *Markings*.
Emarginate, an irregular concavity.
Ferruginous, the colour of rust.
Fulvous, orange-tawny, or orange with a brownish tinge.
Fuscous, brown with a greyish tinge.
Hind-margin, see *Outline of Wing*.
Hybernate, to live through the winter.
Inner margin, see *Outline of Wing*.
Irrorated, speckled or peppered.
Lateral, of or belonging to the side.
Line, see *Markings*.
Longitudinal, see *Markings*.

Medial nervure, the middle rib, vein or nerve between the costa and inner margin.
Nervure, rib, vein or nerve, the framework of the wing.
Oblique, that which goes in a slanting direction.
Ocellated, that which has a spot with a pupil or eye-like centre.
Patch, see *Markings*.
Posterior, that which is behind or furthest from the head.
Quadrate, nearly square.
Segments (abbreviated seg.), rings or divisions of the body of the insect (a caterpillar consists of 13 segments, numbered from the head, which is the first).
Shot, showing different colours when seen in different directions, as in the male of the Purple Emperor.
Spiracles, the breathing-holes of the caterpillar, placed along the sides above the feet.
Spot, streak, stripe, see *Markings*.
Subcostal nervure, the rib, vein or nerve next to the costa.
Suffused, clouded.
Tail of hind-wing, a prolongation from the hind-margin near the anal angle.
Tawny, orange with a brown shade.
Tip, see *Outline of Wing*.
Transverse, see *Markings*.
Tubercles, small wart-like protuberances.
Tubercular processes, elongate wart-like protuberances.
Un-denticulated, not toothed or denticulated.

Throughout the volume, in the descriptions, the special characters by which the species may be distinguished from those most nearly allied to it, are indicated by being printed in SMALL CAPITALS. And in the Butterflies and *Sphingina* the words in *Italics* should first be read out by themselves, as they will furnish a general idea of the insect; thus, at p. 38, we read of *Vanessa Atalanta*, "Black; fore-wing, a broad deep red central band; hind-wing, a broad deep red band at the hind-margin;" and if this suits the supposed *Red Admiral* the student has in his hand, he should read the remainder of the description.

A MANUAL

OF

British Butterflies and Moths.

"Butterflies and Moths" are insects; but bees and wasps, beetles and flies are likewise insects. How, then, are butterflies and moths distinguished from other insects? *By the wings being clothed with scales.* The wings of a butterfly are not transparent like those of a bee, a fly, or a dragon-fly, nor are they horny like the elytra or wing-cases of a beetle; but both surfaces are thickly covered with small scales, which, if removed, would leave the membrane of the wing colourless. It is therefore the colour of these scales which imparts the beauty to these insects which compels our admiration. It is from the two Greek words, λεπις, a scale, and πτερον, a wing, that the scientific term Lepidoptera, used to denote "Butterflies and Moths," is derived. Butterflies and moths have always four wings (the exceptions of undeveloped hind-wings, or of specimens entirely wingless, being comparatively rare). The mouth is furnished with a long spiral sucker, or tubular tongue, by means of which these insects imbibe the nectar of flowers. All butterflies and moths have, previous to their appearance in that state, been successively eggs, caterpillars or larvæ, and chrysalides or pupæ.

It is only while in the caterpillar state that they grow: from their first exclusion from the egg to their becoming full-fed caterpillars they increase vastly in bulk; and the caterpillars are therefore very voracious eaters. When the caterpillars have attained their full size they seek some secluded corner, or penetrate into the earth, and then change to the chrysalis state. The chrysalis has no power of locomotion, having no legs, and being generally firmly attached to some solid substance, or enclosed in a cocoon of silk. If handled it testifies its annoyance by a wriggling of the hinder part of the body. After the insect has remained in the chrysalis state a determinate time, varying according to the species, or to the time of year, the butterfly or moth, as the case may be (then called the perfect insect or imago), appears, with all its parts fully developed, except the wings, which are at first short and limp. The insect crawls to some convenient place, so as to rest with its wings hanging down; and, in a short time, rarely (except in large species) exceeding an hour, the wings are fully expanded, but still limp: in a little while, however, they become stiff and fit for flight, and the insect wings its way to the woods and fields.

Having thus briefly sketched the various changes through which each of these insects passes, the next point to which our attention is drawn is—

How do we distinguish a Butterfly from a Moth?

The antennæ (or horns) *of a butterfly have always a knob or club at the tip;* those of a moth have not. It is a common notion that butterflies are more gaily coloured than moths; and many imagine that the Tiger Moths on that account are butterflies; but it is not so: many butterflies are of dull colours, and many moths are adorned with most beautiful and

varied markings. All butterflies (with one or two exceptions) repose with the wings meeting over the back; very few moths repose in this position.

All butterflies fly by day; the great bulk of moths fly by night, though many fly by day, some species flying both night and day.

The caterpillars of butterflies may also in most instances be distinguished at first sight; for, except the caterpillars of the first family of butterflies, all the others are of peculiar forms, either spiny or with two projecting horns at the head, one on each side, or with two short tails, or fat and short (like a wood-louse), or with the head much larger than the segments behind it. They feed on a variety of plants, from the oak to the cabbage of our market-gardens.

When we first have our attention attracted to a beautiful insect we naturally want to know something about it; *but there is the difficulty:* we see the insect, we admire its beauty; but, unless some kind friend who is acquainted with the insect world introduce us, we are at a loss to obtain a more intimate acquaintance. It is a trite saying, *everything has a name;* but how am I to ascertain the name of this butterfly which I have caught? That is the important question: if I could ascertain its name I might refer to some book, and learn something of its habits and history. Now, the question, so far as relates to a British butterfly, is not a difficult one to answer, if we set about it *determined* to ascertain the name of the species. The British butterflies are only sixty-six in number, and, considering their variety in form, colour, marking and size, it cannot be very difficult to point out in a short-hand way the distinctive characters of each species.

For instance, they may be roughly tabulated thus:—

† Distance between the insertion of the antennæ one-fourth the width of the head.

A. Hind-wings with a long tail. Genus PAPILIO.

AA. Hind-wings with no tail.

B. Wings yellow. Genera GONEPTERYX, COLIAS.

BB. Wings white. Genera APORIA, PIERIS, ANTHOCHARIS, LEUCOPHASIA.

BBB. Under side of the anterior wings with a small eye-like spot near the tip. Genera ARGE, LASIOMMATA, HIPPARCHIA, EREBIA, CŒNONYMPHA.

BBBB. Under side of the anterior wings with no small eye-like spots near the tip.

C. A pale band across the middle of the dark posterior wings. Genera LIMENITIS, APATURA.

CC. Anterior wings more or less angulated. Genera CYNTHIA, VANESSA, GRAPTA.

CCC. Wings rich tawny, with black streaks and spots.

D. Under side of posterior wings with silvery streaks or spots. Genus ARGYNNIS.

DD. Under side of posterior wings with no silvery streaks or spots. Genera MELITÆA, NEMEOBIUS.

CCCC. Wings coppery red. Genus CHRYSOPHANUS.

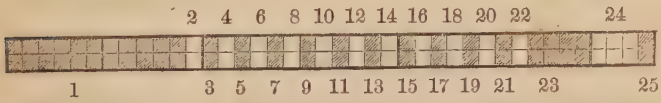
CCCCC. Wings blue or brown, beneath with numerous small eye-like spots. Genus POLYOMMATUS.

AAA. Hind-wings with a short tail. Genus THECLA.

†† Distance between the insertion of the antennæ fully one-half the width of the head. Genera THYMELE, THANAOS, STEROPES, PAMPHILA.

Having ascertained in this way to which genus the species we have caught *must* belong, or at least that it belongs to one of three or four genera, we have but to glance at the table of species for that genus or those genera, and our difficulty is removed.

But, as our few butterflies (and compared with the number of European species the number of British butterflies is indeed few) differ so greatly in size—the smallest, *Polyommatus Alsus*, being under one inch in the expansion of the wings, and the largest, *Papilio Machaon*, being upwards of three inches—it will be found no very difficult matter to name any species by the following table of their comparative sizes, as those species which resemble each other in size generally are very different in other respects.



The foregoing table of measurements shows the average expansion of the wings of our British butterflies, when they are spread out to display their beauties to the greatest advantage. Male insects will often be rather smaller, and female insects rather larger, than the sizes given in this table; but if six or more specimens of the same species are caught and pinned out their *average* size will be found to agree with the measurements we give here. Thus, to take an extreme instance, the males of *H. Semele* are often half an inch less in expanse than the females, the males sometimes being 2 inches and the females $2\frac{1}{2}$ inches; but the average size of the series is found to be $2\frac{1}{8}$ inches (or 2 in. 4 lines).

For this reason the table is not so useful when a single specimen of a new species is caught, as when several specimens of a new species have been taken; nevertheless, it will enable the beginner to find out the name of his new butterfly, in this way: if he has only one specimen, which is a male, and it corresponds with the measurement No. 5, it very likely belongs to No. 6, because, being a male, it is likely to be smaller than the recorded average; while, if it is a female, and its measurement is No. 5, its name is very likely to be found, not in No. 5, but in No. 4, because females generally are above the average size; at all events, if a male, it belongs to either 5 or 6; and, if a female, to either 4 or 5.

Suppose, for example, that you have taken a little blue butterfly, and you think it is a female. When it is pinned out and dry, you compare it with the table of measurements, and find it belongs to No. 5. You see that your insect is blue, mixed or shaded with brown. You look to the list of butterflies which belong to the measurement No. 5, and you find that it is *P. Alexis* ♀.

But, being a female, its name may possibly be in the next smaller list, that is, in No. 4. The only blue butterfly in that list is *P. Ægon* ♂; but your insect is a female, and is shot with brown; and therefore it must be *P. Alexis*.

On the other hand, we will suppose that you are doubtful whether it is a male or a female. In that case it may be either in No. 4, No. 5 or No. 6. On looking to these lists, it may be *P. Ægon*, or *P. Alexis*, or *P. Adonis;* and you can only decide which of the three it is by referring to the more complete descriptions of each insect which we shall hereafter give. This reference, indeed, should always be made, to settle the

question of the identity of the species; because the full descriptions are accurately prepared, while the descriptions given in these measurement-lists are very general, and only enough to distinguish one butterfly from another in the same list.

Key to Table of Sizes.

1	P. Alsus		Brown
2	T. Alveolus		Greenish brown
	P. Actæon		Rich tawny brown
3	P. Artaxerxes		Rich brown, with a white spot on fore-wings
4	C. Phlæas		Bright copper-red
	P. Linea		Tawny, plain
	S. Paniscus		„ chequered
	P. Ægon	♂	Blue
	T. Rubi		Brown, under side green
	T. Tages		„ with darker markings
	P. Ægon	♀	„ centre of fore-wings spotless
	„ Agestis		„ „ „ with a black spot
5	N. Lucina		Dark brown, with tawny spots
	P. Acis	♀	„ „ without spots
	„ „	♂	Blue, under side without orange spots
	„ Alexis	♂	„ „ with „
	„ „	♀	„ shot with brown
	C. Pamphilus		Pale tawny
6	P. Argiolus		Blue, under side pale blue
	„ Adonis	♂	„ „ brown
	P. Sylvanus		Orange-tawny, under side without white spots
	„ Comma		Orange-tawny, under side with white spots
	T. W-album		Brown, without orange spots
	„ Pruni		„ with „
	P. Adonis	♀	„ with a blue gloss

7	P. Corydon	Pale blue
	E. Cassiope	Brown, under side brown
	T. Betulæ	„ „ fulvous
	„ Quercus	„ shot or marked with rich blue
8	C. Davus	Brown or sandy
	C. Chryseis	Bright copper-red
9	L. Sinapis	White
	P. Arion	Blue
	H. Tithonus	Fulvous brown
10	M. Athalia	Under side of hind-wings without black dots
	„ Artemis	„ „ with „
11	A. Selene	Tawny, under side of hind-wings with silvery spots
	M. Cinxia	Tawny, under side of hind-wings without silvery spots
	L. Megæra	Tawny, with white-centred black spots
	„ Ægeria	Brown, with pale yellowish spots
	H. Janira	„ fore-wings with 1 white-centred black spot
	„ Hyperanthus	„ „ 2 „ black spots
	E. Blandina	„ „ 3 „ „
	C. Dispar	Bright copper-red
	A. Cardamines	White, ♂ with a large orange spot
12	P. Daplidice	White
	A. Euphrosyne	Tawny
13	P. Napi	White
	G. C-album	Dark tawny
14	P. Rapæ	White
	C. Hyale	Creamy yellow
	V. Urticæ	Orange-red, with black markings
	A. Lathonia	Orange-tawny, with black spots
15	C. Edusa	Deep yellow

16	A. Galathea	Black and white
17	L. Sibilla	Dark brown, with white markings
18	G. Rhamni	Yellow
	H. Semele	Brown, with yellowish blotches
19	A. Aglaia	Under side of hind-wings without a row of small red spots
	„ Adippe	Under side of hind-wings with a row of small red spots
20	P. Brassicæ	White
	V. Polychloros	Orange-tawny and black, without white spots
	C. Cardui	„ „ with „
	A. Iris ♂	Brown, with white spots, ♂ shot with rich blue
21	A. Cratægi	White
	A. Paphia	Orange-tawny
22	V. Atalanta	Black, with deep orange-red bands
	„ Io	Dull deep red, with large eye-like spots
23	V. Antiopa	Chocolate-red, with broad whitish margin
24	A. Iris ♀	Blackish brown, with white markings
25	P. Machaon	Straw-colour and black

The butterflies which, from the thickened club-like termination of the antennæ, are termed RHOPALOCERA, are divisible into several families, five of which occur in Great Britain, viz. :—

1. PAPILIONIDÆ, including the Swallow-tail, Brimstone, Clouded-yellows and Whites.
2. NYMPHALIDÆ, including the *Hipparchiæ*, *Vanessæ*, Purple Emperor, White Admiral and the Fritillaries.
3. ERYCINIDÆ, consisting of only one species, *Nemeobius Lucina*.
4. LYCÆNIDÆ, including the Hair Streaks, Coppers and Blues.
5. HESPERIDÆ, including the Skippers.

The NYMPHALIDÆ are at once recognized by the perfect insects having the first pair of legs in a rudimentary state, and quite unfit for walking; so that in ordinary speaking we say they have only four legs (in ERYCINIDÆ the males have only four useful legs, though the females have six); the other three tribes have always six serviceable legs in both sexes. The HESPERIDÆ may be at once known by the disproportionately large head, and the antennæ not being inserted close together. The PAPILIONIDÆ may be distinguished readily from the LYCÆNIDÆ in the larva state, but in the perfect state the distinction is not so apparent, except that the PAPILIONIDÆ are mostly large species, varying in size from 3 inches 4 lines to 1 inch 7 lines in expanse; whereas the largest of our LYCÆNIDÆ is only 1 inch 10 lines, and the smallest is under 1 inch, in expanse. Besides, in the PAPILIONIDÆ the main colour is yellow or white; in the LYCÆNIDÆ it is brown, coppery red or blue.

These families are also readily distinguishable in the larva state; for the larvæ of the PAPILIONIDÆ are elongate and of the ordinary form; the larvæ of the NYMPHALIDÆ are either spiny or with two horns, one on each side of the head, or with two short projecting tails; the larvæ of the LYCÆNIDÆ are broad and short, and are termed onisciform (that is, shaped like a wood-louse); the larvæ of the HESPERIDÆ have large heads, and the

segments behind the head are small, making the head appear still more disproportionately large. The sole representative with us of the Family Erycinidæ has an onisciform larva similar to the larvæ of the Lycænidæ.

None who live in the country can be ignorant of the existence of butterflies: from the first sunny days in March, when the Brimstone Butterfly emerges from its winter retreat, till the end of October, when we see *Vanessa Atalanta* feasting on the blossoms of the ivy, they are always before us. In gardens we find the Brimstone and the White Butterflies, an occasional Meadow Brown, Peacocks and Nettle Tortoise-shells, Red Admirals, Small Coppers and Little Blues. In lanes we find, in addition to these, several species of *Hipparchia*, and perhaps the Fritillaries, Hair Streaks and Skippers. The Purple Emperor, White Admiral and most of the Fritillaries require to be sought for in woods. The Swallow-tail and the Large Copper are only to be obtained in the fens of Cambridgeshire and Huntingdonshire, and one of the Skippers, *Pamphila Actæon*, only occurs at Lulworth Cove, Dorsetshire. The two species of *Erebia* and *Cœnonympha Davus* are peculiar to the North of England and Scotland; and the latter country enjoys the exclusive privilege of supplying *Polyommatus Artaxerxes* to our collections. The Clouded Yellows, which frequent meadows, lucerne and clover-fields in autumn, are both deemed rather scarce, especially *Hyale*. Only four of our butterflies are actually rare with us, *Pieris Daplidice* (the Bath White), *Vanessa Antiopa* (the Camberwell Beauty), *Argynnis Lathonia* (the Queen of Spain Fritillary), and *Chrysophanus Chryseis* (the Purple-edged Copper). The first of these has occurred most frequently at Dover; the second has occurred throughout England, but never since 1789

in any plenty; the third is more common than is generally imagined in the southern counties of England; *C. Chryseis* is so rare with us that its existence as a British species is doubted by many, though we have as good evidence for its admission as we had for *Trochilium chrysidiforme* and *Canophila subrosea*, both which used to be doubted, and the former had actually been erased from our lists, both by Mr. Doubleday and Mr. Stephens.

Family I. PAPILIONIDÆ.

Imago with six legs, fitted for walking; larva elongate, cylindrical, smooth or pubescent; pupa attached by the tail and by a belt of silk round the body.

Divisible into two subfamilies, thus:—

Subfamily 1. PAPILIONIDI. Inner margin of hind-wing concave.

Subfamily 2. PIERIDI. Inner margin of hind-wing not concave.

Of the first subfamily we have but one representative in Britain, known at a glance by its size and tailed hind-wings; of the second subfamily we have ten species, divided into six genera, and they may be at once known by the yellow or white ground-colour of the wings, as in none of the following families do either of these colours occur, if we except pale specimens of *Arge Galathea*, which may be at once distinguished by the eye-like spot on the under side of the apex of the fore-wings, a character not possessed by any of the PIERIDI.

All the PAPILIONIDÆ, if we except *Leucophasia Sinapis*, are tolerably brisk flyers, and a good chase is frequently necessary in order to secure one when in view. *Pieris Brassicæ* is a strong flyer; but *Colias Edusa* is far more swift on the wing. *Papilio Machaon* is not only a rapid but a high flyer, capable of soaring, whereas the other species rarely ascend to any height from the ground.

Of this Family the first that greets us in the spring is *Gonepteryx Rhamni*, which, in February or March, if we have hot sunny days, delights to sport in country lanes: with the warm spring weather of April it becomes a more frequent visitor, and is then joined by *Pieris Rapæ* and *Napi*, and a week later by *P. Brassicæ*. These last are especially to be found in gardens and fields, and may be seen not unfrequently in the heart of London. May, if it be but warm (as the month of May *once used to be*), brings out *Anthocharis Cardamines*, and many an eager chase is made to catch this (one of our prettiest species) by the young and ardent entomologist. May is also the time to look for *Pieris Daplidice*, but I cannot give a receipt for finding it. *Papilio Machaon* emerges from the pupa the middle of May; but it is so local an insect with us, that, except in its own private haunts, the fens of Huntingdonshire and Cambridgeshire, it is useless to expect to meet with it. In June *Aporia Crataegi* and *Leucophasia Sinapis* appear, but both are local species and not of general distribution like the common white butterflies. Towards the end of July the second brood of *Pieris Rapæ*, *Napi* and *Brassicæ* may be observed, and they continue throughout August. *Daplidice* is also again to be looked for. In August *Gonepteryx Rhamni* again gladdens our eyes; and *Colias Hyale* in some years may be found in lucerne-fields in the South of England. Towards the end of the month *Colias Edusa*, more beautiful but less valued, because commoner than its congener, appears, frequenting clover-fields and the sunny sloping banks of railways in the South; and throughout September and till late in October stragglers both of this and *G. Rhamni* continue to cross our path, whilst we

are perhaps in search of that one covey of partridges, or a solitary pheasant reputed to be somewhere within our reach.

Any collector may with certainty obtain *Rhamni*, *Brassicæ*, *Rapæ*, *Napi* and *Cardamines* the first year that he looks after them. *Machaon*, *Crataegi* and *Sinapis* he will only find by visiting their localities. If he visit the South coast in autumn he will hardly fail to see *Edusa*, when of course it will be his own fault if he don't catch it. It may be years before he meets either with *Hyale* or *Daplidice*.

Subfamily I.—Papilionidi.

Genus 1. Papilio.

Antennæ rather long, moderately thick; fore-wings long, with arched costa; hind-wings with the margin toothed, and a prolonged tail.

P. Machaon (Swallow-tail). 3″ 4‴ to 4″ 2‴. *F.-w. deep straw-colour, with black lines and spots;* base black; hind-margin black, with 8 straw-colour spots. *H.-w.* straw-colour; inner margin blackish, a brick-red spot at anal angle; a broad bluish black band towards the hind-margin, which is straw-colour festooned with black, and *has a long black tail.* V m—VIII. *Larva* bright pale green, each segment with 2 black bands, the hinder band with 6 orange spots. On *Peucedanum palustre* and other Umbelliferæ. VI e—VIII e. In fens near Cambridge, Norwich, Yaxley and Whittlesea Mere; also at Pulborough, Sussex. Common.

Subfamily II. Pieridi.

Contains six genera, thus divided:—

A. All the wings angulated. Genus 2. Gonepteryx.
AA. All the wings rounded.
  B. Wings yellow. Genus 3. Colias.
  BB. Wings white.
    C. Wings semitransparent (from being thinly clothed with scales). Genus 4. Aporia.
    CC. Wings not semitransparent.
      D. Fore-wings with the apex not rounded. Genus 5. Pieris.
      DD. Fore-wings with the apex rounded.
        E. Fore-wings with a black spot in the middle. Genus 6. Anthocharis.
        EE. Fore-wings with no black spot in the middle. Genus 7. Leucophasia.

Genus 2. Gonepteryx.

Antennæ short and rather thick; all the wings with an angular projection; body rather thick, clothed with long silky down.

Bucks
Hertfordshire

G. Rhamni (Brimstone). 2″ 4‴ to 2″ 6‴. ♂ *brimstone.* ♀ *whitish brimstone, a small orange spot near the centre of each wing.* II h—V h, VIII—X.

Larva dark green, with a pale line on each side. On *Rhamnus catharticus* and *R. Frangula* (Buckthorn). V e—VII m. Generally distributed in the South of England, and common; scarce in the midland counties, and not occurring in Scotland. Bu. Da. Hu. L.D. Le.! M. *Pr.* Sc. Sh.! Wr.! Y.!

Genus 3. Colias.

Antennæ short and rather thick; wings rounded, more or less margined with black; the fore-wings with a black spot in the middle, the hind-wings with an orange spot in the middle.

We have two British species, and of one (*Edusa*) there is a peculiarly pale, constant variety. This may, however, always be distinguished from *Hyale* by the breadth of the black margin at the anal angle of the fore-wings.

C. Edusa (Clouded Yellow). 2″ to 2″ 3‴. *Deep rich yellow with a broad black margin,* which is spotted in ♀, veined in ♂. There is a constant var. of the ♀, which has the ground-colour of the wings dull greenish yellow. VIII e—X m.

Larva dark green, with a white stripe spotted with yellow on each side (*Dup.*). On several leguminous plants. VI m—VII e. Fond of clover-fields and railway-banks. Commoner

in some years than in others. *Be.!! Bl.!!* Brg.! *Brs.* Bu. *Ct. Da.* Do. Ep. Ex. *I.* K. *L.D. Lw.! Lc.* Ly. *M.* Pt. *Pl.! Te.! Tr.* Wi.! *Wt.! Y.*

C. Hyale (Pale Clouded Yellow). 1″ 10‴ to 2″ 1‴. *Pale yellow. F.-w.—Tip blackish, spotted with pale yellow*, blackish hind-margin scarcely extending to anal angle. H.-w.—Hind-margin with a narrow blackish border near the outer angle. VIII.

Larva sea-green, a yellow line on each side and two yellow lines on the back, the latter intersecting black spots on each segment (*Freyer*). On several leguminous plants. VI—VII b. Generally scarce, commoner sometimes (in 1842 very common). Frequents lucerne-fields. Be. *Bl.* Brg. *Brs. Do. Ep. I. Lw. Lc. M. Pt.* R. *Y.*

Genus 4. Aporia.

Antennæ longer than in the two preceding genera, but thicker than in Pieris; wings rather transparent, not decidedly opaque as in Pieris.

A. Cratægi (Black-veined White). 2″ 5″ to 2″ 8‴. *White, with* strongly defined *black veins*, which are clouded at hind-margin of f.-w. VI.

Larva covered with whitish hairs: sides and belly ashy grey; back black, with 2 reddish yellow stripes (*Boisdr.*). On hawthorn, sloe, apple, pear and plum. V b—V e. A local species, occurring at *Cr. Do.!* Lw. Ly.!! *Pt.! Wr.* Herne Bay and Sturry, in the Isle of Thanet; and Moreton, Devon.

Genus 5. Pieris.

Antennæ long and slender; wings white, fore-wings rather pointed, tipped with black or blackish; in the female always with a black or blackish spot near the anal angle.

Larva green or green striped with yellow, or bluish striped with yellow; feeding on *Cruciferæ* and *Resedaceæ*. All the species double-brooded.

The four species may be thus distinguished:—

A. Under side of hind-wings dull creamy yellow, with grey atoms.
  B. Expansion of the wings 2½ inches. *P. Brassicæ.*
  BB. „ „ 2 „ *P. Rapæ.*
AA. Under side of hind-wings pale yellowish, *veined* with yellowish grey. *P. Napi.*
AAA. Under side of hind-wings greenish, *spotted with white.* *P. Daplidice.*

P. Brassicæ (Large White). 2″ 4‴ to 2″ 8‴. *White. F.-w.*—Black *at tip*, base and costa blackish; ♂ *spotless*, ♀ *with* 2 *black spots* and a black dash on inner margin. H.-w.—Costa with a black spot. IV e—VI and VII e—VIII.

Larva yellowish spotted with black; a row of raised black spots on each side of the back. On cabbages, Tropæolum and several Cruciferæ. VI and IX. Common everywhere.

P. Rapæ (Small White). 1″ 10‴ to 2″ 2‴. *White. F.-w.* —Faintly blackish *at tip* and base; ♂ *spotless or with one blackish spot*, ♀ *with* 2 *black spots* and a clouded dash on inner

margin. H.-w.—A black spot on costa. IV m—VI and VII m—VIII.

Larva green irrorated with black, a row of yellow spots on each side in a line with the spiracles. On cabbages, mignonette, Tropæolum and various Cruciferæ. VI and IX. Common everywhere.

P. Napi (Green-veined White). 1″ 7‴ to 1″ 11‴. *White*, with blackish veins. F.-w.—Blackish at tip; ♂ with 1 black spot, ♀ with 2 black spots and a black dash on inner margin. *H.-w.*—♀ with, ♂ with or without, a black spot on costa; *u. s. veins clouded with greenish.* IV m—VI and VII m—VIII.

Larva green; spiracles red, each in a yellow spot (*Boisdv.*). On *Brassica Napus* and other Cruciferæ. VI and IX. Common everywhere.

P. Daplidice (Bath White). 1″ 10‴. *White. F.-w.—Tip black, spotted with white;* a large central black spot; a more or less distinct *blackish spot near the anal angle. U. s., h.-w., greenish spotted with white.* V and VIII.

Larva bluish, spotted with black and with a pale yellow line on each side and 2 pale yellow lines on the back (*Freyer*). On *Reseda lutea, R. luteola* (weld), &c. VI and IX. Has occurred at Dover, Whittlesea Mere, Worcester, &c., but only singly.

Genus 6. Anthocharis.

Antennæ not long, slender; wings white, fore-wings *rounded* at the tip; the female with no blackish spot near the anal angle; abdomen moderately slender, not nearly so long as the hind-wings.

A. Cardamines (Orange Tip). 1″ 8‴ to 1″ 11‴. *White*, F.-w.—Tip blackish, a small black spot near the centre; ♂ *with* (♀ *without*) *the tip-half of the wing deep orange. U. s., h.-w., chequered with yellowish green.* IV e—V e.

Larva green, a whitish stripe on each side (*Dup.*). On *Cardamine impatiens, Turritis glabra* and other Cruciferæ. VII. Common everywhere.

Genus 7. Leucophasia.

Antennæ not long, slender; wings white; fore-wings rounded at the tip, *very slender at the base;* abdomen *very slender, projecting beyond the hind-wings.*

L. Sinapis (Wood White). 1″ 5‴ to 1″ 7‴. *White, spotless. F.-w.—Tip blackish.* U. s., h.-w, clouded with blackish. V and VIII.

Larva green, with a yellow stripe on each side (*Boisdv.*). On *Vicia cracca, Lotus, Lathyrus, Orobus,* &c. VI and IX. Local, frequenting woods near Bl. Brg.! Do. *Ep.!* Ex. L.D. Lw. Lc. *Ly.!!* Pm.! Pl. St.! Te.!! Wa. Wr.!—also at Dursley, Gloucestershire, and Monk's Wood, Hunts.

Family II. NYMPHALIDÆ.

Imago with only four legs fitted for walking (the first pair being rudimentary); larva elongate, cylindrical, spiny or with two horns at the head, or a forked tail; pupa suspended by the tail, with no belt of silk round the body.

Divisible into four Subfamilies, thus:—

Subfamily 1. SATYRIDI. Wings rounded, with white-centred black spots on the under side or on both sides.

Subfamily 2. NYMPHALIDI. Wings rounded, or hind-margin of fore-wings concave; a pale band on the middle of the hind-wings.

Subfamily 3. VANESSIDI. Wings with angular projections, or at least with a projection in the hind-margin of fore-wings.

Subfamily 4. ARGYNNIDI. Wings rounded, or hind-margin of fore-wings concave, tawny spotted with black.

Of the first Subfamily, the SATYRIDI, we have five genera, comprehending eleven species; of the second, the NYMPHALIDI, we have but two genera, each containing a single species; of the third, the VANESSIDI, we have three genera, comprising seven species; and of the last, the ARGYNNIDI, we have two genera, including eight species. Thus the family NYMPHALIDÆ comprises twelve genera and twenty-eight species, nearly the half of the British butterflies.

The SATYRIDI are not strong flyers, and may generally be caught without much trouble; but the NYMPHALIDI and VANESSIDI are the most powerful flyers that we have amongst the butterflies, and frequently soar over the tops of lofty trees; indeed, *Apatura Iris* (the Purple Emperor) selects for his residence the topmost spray of a lofty oak, disdaining the humble sallow in its neighbourhood, on which, when in the larva state, he had fed, though sometimes he will condescend to alight on a muddy spot to quench his thirst: *then is the time to catch him.*

Of the ARGYNNIDI the larger species are tolerably strong on the wing, but may be caught, by proceeding with due caution, whilst they are sipping nectar from some thistle or bramble-blossom.

Of this Family the first that greet us in the spring are the hybernating *Vanessæ*, *Io*, *Polychloros* and *Urticæ* (which we find in lanes, in gardens, and not unfrequently in houses); and even *Antiopa*, when it does appear, may be found in April. The end of April *Lasiommata Ægeria* emerges from the pupa, frequenting woods, or lanes near woods. The following month *Lasiommata Megæra* appears, and may be found in lanes throughout the country. Towards the end of May open places in woods, then flowery with blue-bells, bugles and violets, should be visited for *Argynnis Euphrosyne*, which a fortnight later is joined by his neighbour, *Selene*. Before the end of June *Hipparchia Janira* and *Cœnonympha Pamphilus* may be found in every field, and continue to attract our attention till late in August: these two butterflies are of universal distribution. The three *Melitææ*, *Cinxia*, *Athalia* and *Artemis*, should now be sought in their respective localities. In July *Arge Galathea* should be looked for in its known localities, and the second brood of *Ægeria* appears in woods; *Hipparchia Tithonus* and *Hyperanthus* will be found pretty generally distributed in lanes and woody places; *Erebia Cassiope* will be found in its mountain haunts, and *Cœnonympha Davus* on northern moors. But the greatest prizes of this month must be sought for in woods in the South, where *Limenitis Sibilla* and *Apatura Iris* are oftener seen than caught. *Vanessa Io* will be found both in lanes and in gardens, where it likes to sun itself on the China Aster, in company with the more

abundant *V. Urticæ*. *V. Polychloros*, though emerging from the pupa at the end of July, is very rarely seen till after hybernation. In the localities where *Grapta C-album* occurs, now is the time to look for it; in fact, the entomologist is now in a plethora of riches; for simultaneously appear the three larger *Argynnes*—*Paphia*, *Aglaia* and *Adippe*; and the first sight of any of these is apt to unnerve the tyro, who strikes at random, and frequently misses the object of his admiration. In August appears the second brood of *Lasiommata Megæra*, and *Hipparchia Semele*, though local, is now abundant; *Blandina* will tempt the collector to Scotland, a worthier object of pursuit than grouse. At this time, in certain seasons (for its appearance is most *un*certain), *Cynthia Cardui* is to be met with in cloverfields and waste places; and *Vanessa Atalanta* begins to join its congeners at sucking sweets from the flowers and fruits of our gardens. Now, too, is the time for *Antiopa* to appear; but those who see it will be lucky. The second brood of *Argynnis Lathonia*, which is the only one usually found in this country, may now be met with in woods, or lanes near woods, in the South; and a few straggling specimens of a second brood of *A. Selene* and *Euphrosyne* are also now occasionally to be met with on the wing. When September sets in, the great harvest of the collector for this Family is over: the *Lasiommatæ*, *Ægeria* and *Megæra*, and *Cynthia Cardui*, and the *Vanessæ*, still continue in their respective haunts; and perhaps a chance *Lathonia* may yet redeem the day's excursion from being "flat, stale and unprofitable." In October may yet be found stragglers of *Io*, *Urticæ* and *Atalanta*, the latter especially appearing loath to leave us, and sitting on the flowers of the dahlias, and frequenting the ivy when in bloom.

Any collector may reckon upon meeting with *Ægeria*, *Megæra*, *Janira*, *Tithonus*, *Pamphilus*, *Io*, *Atalanta*, *Urticæ*, the first season he looks after them: and by visiting woods in the South, at the right time of year, he may calculate with some certainty on finding *Paphia*, *Aglaia*, *Adippe*, *Selene* and *Euphrosyne;* probably also *Hyperanthus*. *Cardui* and *Polychloros* are commoner in some seasons than others, and are not always to be found. *Galathea*, *Semele*, *Cinxia*, *Athalia* and *Artemis* are local species, and, though when found generally abundant, one may collect for years without meeting with them. *Sibilla*, *Iris* and *C-album* have also their favourite resorts, where they may be found not uncommonly, but are not of general distribution. *Blandina*, *Cassiope* and *Davus* are all exclusively northern species, and need not be looked for at all in the South. *Blandina* and *Davus* are common in many localities, and those who take them will probably be glad to exchange with collectors in the South for *Galathea*, *Sibilla*, *Cinxia* and *Athalia*. *Cassiope* is a scarcer insect, and, though found in several parts of the Lake District and in the North of Perthshire, is rarely taken in abundance. The collector may thus in a few years obtain all the NYMPHALIDÆ, except the two rare species, *Antiopa* and *Lathonia;* and, though the latter seems to occur pretty generally throughout the South of England, though sparingly, and the former is scattered all over the country, it may be many years before the collector has the good fortune to meet with either of them.

Subfamily I. Satyridi.

Contains five genera, thus divided:—

A. Wings black and white. Genus 1. Arge.
AA. Wings not black and white.
B. Eyes hairy. Genus 2. Lasiommata.
BB. Eyes naked. Genera 3, 4 and 5. Hipparchia, Erebia and Cœnonympha. This latter genus is distinguished from all, excepting *Erebia Cassiope*, by the undenticulated hind-wings.

As the family resemblance of the Satyridi is rather strong, I give here a table of all the species.

Galathea, I presume, is sufficiently distinguished by its black and white colour; the remainder, thus:—

A. Fore-wings with one black spot, with one white centre.
B. Hind-wings with three or four white-centred black spots.
C. Wings dark brown, with cream-coloured spots. *L. Ægeria.*
CC. Wings tawny, with brown markings. *L. Megæra.*
BB. Hind-wings with no white-centred black spots. *H. Janira.*
AA. Fore-wings with one black spot, with two white centres. *H. Tithonus.*
AAA. Fore-wings with one black spot, with no white centre. *C. Pamphilus* and many specimens of *C. Davus*, though this latter is very variable, and frequently has *two to four* black spots.
AAAA. Fore-wings with two black spots, with white centres.
D. Hind-wings with one white-centred black spot. *H. Semele.*
DD. Hind-wings with two white-centred black spots. *H. Hyperanthus.* This latter, however, is an exceedingly variable species in the number and distinctness of the spots, and is best recognized by its dark black-brown colour.

AAAAA. Fore-wings with three (or four) black spots, with white centres, the two upper spots united. *E. Blandina.*

AAAAAA. Fore-wings with four black spots, with no white centres. *E. Cassiope.*

The larvæ of all the species feed on grasses, and have a short forked tail, by which they may be at once recognized.

Genus 1. Arge.

Eyes naked; antennæ rather thick, with a long club; *wings black and white;* hind-wings denticulated.

A. Galathea (Marbled White). 2″—2″ 2‴. *Creamy white marbled with black, as much black as white;* hind-margins black, with a row of whitish spots; fringes black and white. U. s.—F.-w. near the apex with 1, h.-w. near the hind-margin with 6, white-centred black spots in white rings. VII m—VIII m.

Larva green, with two yellowish lines on each side; head and bifid tail reddish (*Dup.*) On Timothy-grass (*Phleum pratense*).

Very local. Meadows. Be.! Bl.!! Brg.!! Ct.!! Do. Ep.! *Ha.* K.!! Lw. Ly.! Pt. Pl. Te.! Wr. Y.! Dursley.

Genus 2. Lasiommata.

Eyes hairy; antennæ slender, with the club long or short; hind-wings more or less denticulated (much more so in *Ægeria* than in *Megæra*).

Independently of the difference of ground-colour, the two species may be readily distinguished by the under side of hind-wings, which in *Megæra* have 6—7 distinct white-centred black spots, whereas in *Ægeria* there only a few dull whitish spots, not surrounded with black.

L. Ægeria (Speckled Wood). 1″ 8‴—2″. *Brown, with yellowish spots* towards hind-margins, which are brown. *F.-w. with* 1, *h.-w. with* 3, *white-centred black spots* in yellowish spots. IV m—V m; VII and VIII.

Larva dull green, with a rather broad whitish stripe on each side (*Sepp.*) On *Triticum repens* (couch-grass) and other grasses. VI and X.

Common everywhere in woods and shady lanes.

L. Megæra (Wall). 1″ 9‴—2″. *Fulvous, with rich dark brown markings. F.-w. with a white-centred black spot* near the tip. *H.-w. with three white-centred black spots* near the hind-margin, and an indistinct fourth at the anal angle. V, VIII and IX.

Larva green, with three very a int pale dorsal lines, and a more distinct pale line on each side. On various grasses. IV and VII.

Common everywhere in lanes and hedgerows.

Genus 3. Hipparchia.

Eyes naked; antennæ slender, with the club long or short; hind-wings more or less denticulated; subcostal *and medial* nervures of fore-wings much dilated at the base.

The four species may be thus recognized:—

A. Under side of fore-wing tawny margined with brown.
  B. Two white-centred black spots in fore-wing. *H. Semele.*
  BB. One white-centred black spot in fore-wing.
    C. The spot with one white centre. *H. Janira.*
    CC. The spot with two white centres. *H. Tithonus.*
AA. Under side of fore-wings entirely brown, without any tawny mixture. *H. Hyperanthus.*

H. Semele (Grayling). 2″ 1‴—2″ 9‴. *Dull brown. F.-w.*—2 *black spots, with indistinct white centres* in the pale part beyond the middle; hind-margin brown. *H.-w.* — 1 *white-centred black spot* in the paler part beyond the middle. VII m—IX b.

Larva, upper part dull flesh-colour, with three dull greyish green stripes; beneath dull greenish; with a dark lateral line (*Dup.*) On various grasses. V.

Local. On dry banks and rocky places. Be.! Bi.!! Bl.!! Brg! Brs.!! Da.! Ed.! Ex.!! G.! I.! L.D.! Lw.! Ly.! Pl.!! Sh.! Te.!! Tr.! Wi.! Wr.

H. Janira (Meadow Brown). 1″ 9‴—1″ 11‴. *Dull brown. F.-w.*—*A white-centred black spot* near the tip, in a fulvous ring in ♂, *in a* large central *fulvous patch* in ♀. VI e —VIII e.

Larva pale apple-green, with a white stripe on each side (*Dup.*) On smooth-stalked meadow-grass (*Poa pratensis*) and other grasses. V.

Abundant everywhere.

H. Tithonus. 1″ 4‴—1″ 7‴. *Brown, with a large central fulvous patch in each wing. F.-w.*—*A black spot containing two white dots near the tip;* ♂ with (♀ without) a clouded brown mark extending from the middle of the inner margin towards the spot. H.-w.—♀ a white-centred black spot near the anal angle. VII and VIII.

Larva greenish or grey, with a dark dorsal line and two pale lines on each side; head reddish (*Sepp.*) On annual meadow-grass (*Poa annua*). VI.

Abundant in the South and midland counties of England; common in the L.D.; but not occurring in Scotland.

H. Hyperanthus (Ringlet). 1″ 7‴—1″ 10‴. *Smoky brown, with white-centred black spots, each in a pale tawny ring,*

indistinct in ♂, distinct in ♀. F.-w., 1 to 3 spots; h.-w., 2 spots. U. s. tawny brown, with very distinct white-centred black spots, each in a tawny ring; f.-w., 2 or 3 spots, the third having no white centre; h.-w., 5 spots. VI e—VII e.

Larva greenish grey, with a darker dorsal line, and two paler lines on each side (*Sepp.*) On common millet-grass (*Milium effusum*) and annual meadow-grass (*Poa annua*). VI.

Common in woods and thickets. Generally distributed.

Genus 4. Erebia.

Eyes naked; antennæ slender, with the club rather long; hind-wings slightly denticulated (as in *Blandina*) or rounded (as in *Cassiope*); *only the* subcostal nervure of fore-wings much dilated at base.

The species of this genus are also distinguished by the dark brown-black colour of the wings, with reddish bands containing black spots towards the hind-margins. They frequent mountainous districts.

New species of British butterflies are more likely to occur in this genus than in any other.

E. Blandina. 1″ 10‴—1″ 11‴. *Rich dark brown, with a reddish patch near the hind-margin* of each wing, *and in it* generally *three white-centred black spots.* F.-w.—Upper pair of spots united. Fringe sometimes varied with pale grey, never with white. VII m —VIII m.

Larva "light green, with brown and white longitudinal stripes; head reddish" (*Duncan*). Food unknown.

Only in the North. Kendal. Colne. Wharfdale, in Yorkshire. Castle Eden Dene. Arran, and other localities in Scotland.

E. Cassiope. 1″ 3‴—1″ 6‴. *Brown, with about* 4 *small black dots in a reddish fulvous patch,* or each in a reddish

fulvous ring *near the hind-margin* of each wing. Number of spots variable. VI.

LARVA UNKNOWN.

Only in the North. In the L.D. at Styhead Tarn, Borrowdale, Langdale Pikes, &c.; always at a great elevation in marshy hollows on the mountain-sides. Rannoch, Perthshire.

Before it can be assumed that the total number of butterflies occurring in Britain is fully known, more search must be made for the species of the genus EREBIA. Boisduval enumerates no less than *seventeen* species occurring among the Alps, and *three* species from Lapland. Now, till every part of our Welsh, Scotch and Irish mountain districts has been fully explored, who can say that none of these occur with us? Many of these insects are *excessively local;* and there must be many a mountain-side where the foot of an entomologist has never trod; or, even if an entomologist may have been there, it was probably at the wrong time of the year, perhaps in May or June; whereas *the undetected new British species* was then either a busily feeding larva or a quiescent pupa. Entomologists must be developed from those living among the mountains; those who are *on the spot* have many opportunities denied to the occasional tourist. Many a hill-side has had its botanical treasures catalogued by a resident: cannot the same observer, whose catalogue of plants *being* complete,—

"Othello's occupation's gone,"

—cannot he, I say, turn his attention to Entomology, and so enable us to know the extent of our native riches?

The search for undetected species is not by any means a wild-goose chase. *Cassiope* was not always as common an insect

as it is at the present day; and the following passage in Stephens' 'Illustrations,' published in 1827, will be read with considerable interest, as showing how long that insect was, from its rarity, but a *reputed* British species:—"Described by Mr. Haworth, about fifteen years since, from specimens in the collection of the late Mr. Francillon, to whom they were presented by T. Stothard, Esq., R.A., their captor and reputed discoverer of the insect in Britain; but, however, a single specimen was previously obtained by Dr. Leach from the cabinet of the late Dr. Lettsom, which was said by the latter to have been taken in Cumberland. From the circumstance of so many years having 'rolled on' without other specimens of the insect occurring, its native origin began to be questioned; but the past season has undeniably set the question at rest, through the instrumentality and industry of Mr. Dale, who was furnished with its locality from Mr. Stothard, and, accompanied by Mr. Curtis, procured many specimens of the male from the grassy sides of the mountains in the vicinity of Ambleside. The discovery of the female is, however, due to an indefatigable collector—and one who disposes of the insects he collects—Mr. Weaver, of Birmingham, who found several of each sex, in different localities in the counties of Westmoreland and Cumberland, during the month of July."

It is by learning the habits and times of appearance of European species likely to be found here, and by then seeking for them, that discoveries of new British insects are most surely to be made. This is the plan lately adopted in reference to many of the small moths; and no reason exists why it should not meet with a fair amount of success if applied to the larger moths, or even to the butterflies.

Ligea may occur in the Isle of Arran; but why do not the entomologists who reside there seek for it?

Genus 5. Cœnonympha.

Eyes naked; antennæ slender, with rather long club: hind-wings rounded, *not denticulated;* subcostal, medial *and subdorsal* nervures of fore-wings much dilated at the base.

The two species have a family resemblance, but are distinguished readily by size; and *Davus,* which is an excessively variable species (some of the Scotch specimens being quite as pale as *Pamphilus*), may be always recognized with certainty by the distinct *white-centred black spots in tawny rings on the under side of hind-wings.*

C. Davus 1″ 4‴—1″ 6‴. Varying from brown to pale *tawny, with more or less distinct black spots in tawny rings,* F.-w., 1 spot near the tip; h.-w., 3 or 4 spots towards the hind-margin. U. s. darker, with DISTINCT WHITE-CENTRED BLACK SPOTS IN PALE TAWNY RINGS, and with pale band-like markings across the centre of each. F.-w. somewhat fulvous, with 1 to 4 spots; h.-w. somewhat ashy, with 6 or 7 SPOTS. VI and VII.

Larva unknown.

Only in the North. On moors and mosses. Chartley Park, near Uttoxeter. Chatmoss, near Manchester. Thorne Moor and Hatfield Chase, in Yorkshire. Pr. L.D. Pentland Hills, and other Scotch localities.

C. Pamphilus (Small Heath). 1″ 1‴—1″ 3‴. *Tawny,* shading into brown at the margins. *F.-w.—A* more or less distinct *blackish spot near the tip.* U. s.—F.-w. tawny, ashy grey at the hind-margin and at the tip, where is a white-centred black spot in a pale tawny ring; h.-w. ashy grey, brownish at

base, a central whitish band, and then a narrow brown band, in which are 3 to 6 white dots. VI—IX.

Larva fine apple-green, with 3 deep green stripes bordered with whitish, the dorsal one being the largest: head and under side yellowish green: anal points reddish (*Dup.*) On annual meadow-grass (*Poa annua*), crested dog's-tail-grass (*Cynosurus cristatus*), &c. V—VIII.

Common everywhere.

Subfamily II. Nymphalidi.

Contains two genera, the most striking characters of which are furnished by the larvæ, which in Limenitis are furnished with numerous spines, whereas in Apatura they are smooth and attenuated towards the tail.

Apatura may be distinguished from Limenitis by the ocellated spot on the hind-wings of the perfect insect.

Genus 6. Limenitis.

Antennæ with a long slender club; wings denticulate; hind-wings *with no ocellated spot.*

Contains but one British species, of which the spiny larva feeds on honeysuckle.

L. Sibilla (White Admiral). 2″ 1‴—2″ 5‴. *Blackish brown, with a broad white band crossing the centre of the wings,*

interrupted in the middle of the f.-w. F.-w.—1 whitish spot between the base and the band, 2 on the costa near the tip, and 1 on the hind-margin. U. s.—H.-w. silvery blue at the base and inner margin. VI e—VII e.

Larva pale green, with a lateral white stripe on the last 7 segments; long, ferruginous, branched spines on the 3rd, 4th, 6th, 11th and 12th segments; short spines on the 7th to 10th; two rows of short spines on each side; BELLY GREEN (*Dup.*) On *Lonicera periclymenum* (honeysuckle). V e.

Woods in the South. Ep. *Ly.!! Wr. Tn.* Beer Regis, Colchester, and Black Park.

Genus 7. APATURA.

Antennæ rather thick, with distinct moderately long club; *body robust;* hind-wings *with an ocellated spot.*

We have but one species, of which the smooth larva, very stout in the middle and much attenuated towards the tail, has often been compared to a green slug.

A. IRIS (Purple Emperor). 2″ 6‴—3″ 3‴. *Blackish brown;* ♂ *with,* ♀ without, a *rich purplish blue gloss; a broad*

white band crossing the middle of the h.-w. and extending into the middle of the f.-w. F.-w.—5 white spots in a curve from the costa to the anal angle, and 3 near the tip. *H.-w.—Anal angle fulvous, and near it a black spot in a fulvous ring.* VII.

Larva pale green, with oblique yellow lines and a yellow stripe on each side; head with two green tentacle-like horns (*Dup.*) On poplars and sallows. VI b and m.

Woods in the South, on the tops of oaks. *Brg. Ep.! Lc.* Ly. Pm.! St. Tn. Monkswood, Hunts. Clapham Park Wood, Beds. Lincoln. Bourne; also near Ticehurst, Sussex.

The desire to possess *Apatura Iris* is one common to all collectors of butterflies; and when seen on the wing the desire to catch instantly seizes the collector. The recipe usually given is, to use a ring-net on the end of a pole thirty or forty feet long. No doubt one might, by constant practice, learn to handle such a net with great dexterity; but at best it is a cumbersome, awkward weapon; and a wiser plan is, to watch for opportunities of taking the Purple Emperor when he descends from his throne.

All monarchs have their moments of relaxation; and I have heard of *Iris* being ignominiously taken on the ground, feasting beneath a gooseberry-bush, on fallen gooseberries. He evidently had a *penchant* for home-made gooseberry wine, perhaps esteeming it better than champagne. Muddy places are also known as another resort of his majesty; and a clever French entomologist, who, unfortunately for science, died young (M. Pierret), says, "Il se repose sur les matières excrémentielles;" and, however we may regret such coarse taste in so lordly an insect, yet, if the fact be so, we do well to profit by the knowledge of it to enrich our collections.

An entomologist once took shelter from a heavy shower under

an oak-tree in Knowle Park, near Sevenoaks: the result was that he found two specimens of *Iris*, at rest, on the lower part of the trunk; and it might not be a bad speculation to profit by wet and dull days during the season, by looking in such places of repose.

Iris may probably, however, best be obtained by rearing it from the larva; and those who wish to obtain fine specimens should carefully search on the sallows in the localities which are known to be frequented by the perfect insect.

Subfamily III. Vanessidi.

Contains three genera, best distinguished by the form of the fore-wings, thus:—

A. With the projection in hind-margin of fore-wings hardly perceptible. Genus 8. Cynthia.
AA. With the projection in hind-margin distinct.
B. Inner margin of fore-wings nearly straight. Genus 9 Vanessa.
BB. Inner margin of fore-wings deeply emarginate. Genus 10. Grapta.

All the larvæ are spiny, but the larva of Grapta is distinguished from the others by the tubercular processes on the head.

Genus 8. Cynthia.

Antennæ with a short club: fore-wings with *a slight projection* in hind-margin above the middle.

Larva spiny, solitary.

We have but one species in this genus, which appears irregularly: in no single locality do I find that it is a regular visitor.

C. Cardui (Painted Lady). 2″ 5‴—2″ 8‴. *Pale orange red, spotted and mottled with black*, bases blackish. *F.-w.—Tip black, with* 1 *large and* 4 *small white spots.* U. s.—F.-w. ashy grey, reddish towards the base, with blackish and whitish markings. H.-w. ashy grey, lined with whitish, and having 4 many-coloured spots, each in a dark-outlined yellowish ring. III. h—V h, VII e—IX.

Larva brown, with 4 yellow lines (2 dorsal and 2 lateral); 3rd and 4th segments with 4 spines; 5th to 11th, 7 spines: 12th, 4 spines; 13th, 2 spines (*Dup.*). On thistles (*Carduus nutans*, *C. acanthoides* and *C. lanceolatus*). VI—VII.

Generally distributed, but uncertain in appearance. Some years very abundant.

Genus 9. Vanessa.

Antennæ with the club rather prolonged; fore-wings with a *distinct projection* in the hind-margin above the middle; *inner margin nearly straight;* hind-wings with a *short* projection in hind-margin (except in *Atalanta*).

Larvæ spiny, solitary (*Atalanta*) or gregarious (*Io*, *Urticæ*, *Antiopa* and *Polychloros*), feeding on nettles (*Atalanta*, *Io*, *Urticæ*), willows (*Antiopa*), or elms (*Polychloros*). All the species are single-brooded, except *Urticæ*, of which there appears to be a *succession of broods* during the summer. All the species hybernate, and reappear on sunny days in the

spring; but *Atalanta* is less frequently seen in the spring than any of the others.

The five species may be thus distinguished:—

A. Wings black, with red bands. *V. Atalanta.*

AA. Wings deep dull red, each with a large many-coloured eye-like spot. *V. Io.*

AAA. Wings purplish chocolate, with white hind-margins. *V. Antiopa.*

AAAA. Wings reddish orange, with black spots.

B. No white spot on costa of fore-wings. *V. Polychloros.*

BB. A white spot on costa of fore-wings near the tip. *V. Urticæ.*

V. Atalanta (Red Admiral). 2″ 7‴—2″ 10‴. *Black. F.-w.*, 1 large and 5 small white spots near the tip, and *a broad deep red central band; h.-w., a brood deep red band at the hind-margin*, and 4 black spots in it; 1 large blue and black spot at the anal angle. VIII—X b.

Larva yellowish grey, with a pale yellow lateral line; 3rd and 4th segments with 4 spines: 5th to 12th, 7 spines,—between the 2nd and 3rd row of spines is a row of black V-like marks: head and legs black: prolegs reddish. On *Urtica dioica* (nettle). VI—VII.

Common everywhere.

V. Io (Peacock). 2″ 6‴—2″ 9‴. *Dull deep red;* hind-margins brown. *F.-w.*, 1 small and 1 large black costal mark, beyond which is *a large eye-like spot variously coloured* with yellow, black, red, bluish lilac, rosy and white; *h.-w., a large black eye-like spot shaded with bluish lilac*, placed in a pale brown ring near the outer angle. III h—V h, VIII—IX.

Larva black, with numerous white dots; 3rd and 4th segments with 2 spines; 5th, 4 spines; 6th to 12th, 6 spines; 13th, 2 short spines. On *Urtica dioica* (nettle). VI—VII.

Common in England; scarce in Scotland.

V. Antiopa (Camberwell Beauty). 2″ 10‴. *Purplish chocolate, with broad whitish hind-margins*, adjoining which is

a broad black band, containing 6 or 7 blue spots to each wing. F.-w., 2 whitish costal spots beyond the middle. III h—V h, VIII—X.

Larva black dotted with white, with numerous spines, and a large red spot on the 4th to 11th segments, each spot intersected by the black dorsal line (*Hub.*). On *Salix alba* (willow), &c. VI—VII.

Occurs occasionally at *Be. Brs. Bu. Cr. Ep. K. L.D. Le. M. Pr. R. St. Wi. Wt. Y.*

This insect is extremely irregular in its appearance, and has hardly been seen since 1847.

V. Polychloros (Large Tortoise-shell). 2″ 6‴—2″ 8‴. Deep fulvous, *with a broad dark border. F.-w.,* 3 *large black spots on costa,* 2 *smaller in the centre, and* 2 *near the inner margin;* h.-w., a large black spot on costa, and flat blue crescents in the dark margin. III h—V h, VII e—VIII e.

Larva tawny, with numerous spines and a broad blackish lateral stripe (*Sepp.*). On elm. VI e—VII.

Occurs in the South, but not generally common. Be. Bl. Brs. Bu. Do.! Ep.! Hu. *K. Lw.* Lc. Ly.!! *M.* Pm.! Pt. Pl. R.! Sh. St.! Te. Tn.! Wa. Wi. Wr. *Y.*

V. Urticæ (Small Tortoise-shell). 2″ 1‴—2″ 3‴. Reddish orange, *with a dark border,* in which are semicircular, crescentic, blue spots. *F.-w.,* 3 *large black spots on the costa,* 2 *small in the centre, and* 1 *large on inner margin,*—and

beyond the 3rd costal spot a WHITE *spot;* h.-w., basal half black. III h—V h, VI—IX.

Larva yellowish grey, with a black dorsal line and a broad brownish lateral stripe, beneath which is a yellowish line; 3rd and 4th segments with 4 spines; 5th to 12th, 7 spines; prolegs yellowish grey. On *Urtica dioica* (nettle). VI b—VIII e.

Abundant everywhere.

Genus 10. GRAPTA.

Fore-wings with a distinct projection in the hind-margin above the middle; *inner margin deeply emarginate;* hind-wings with a *long* projection in hind-margin.

Larva spiny, with two tubercular processes on the head.

G. C-ALBUM (Comma). 1″ 11‴—2″ 4‴. *Deep fulvous,* with narrow dark brown margins, *with black and brown spots. U. s.,* dusky brown; *h. w., a central white C-like mark.* IV h—V h, VII—VIII.

Larva pale fulvous; 7th to 13th segments whitish on the back; head and 2nd segment black; head with two short ear-like projections (*Dup.*). On elm, currant, sloe, hop and nettle. VI—VII.

Not in the eastern, metropolitan and south-eastern counties, nor in Scotland. Brs. Bu. *Ct. Da.!* Do. L.D. *Lc. M.* Pt. *Sc.! Sh.* Wa. Wr.! Y.! Gloucester. Carlisle. This has disappeared from many places where it was formerly abundant. All the old writers record it as being "abundant near London," and many entomologists now living can remember that, when they were young, such was the case.

Subfamily IV. Argynnidi.

Contains but two genera, thus distinguished:—

A. Under side of hind-wings with silvery streaks or spots. Genus 11. Argynnis.

AA. Under side of hind-wings with no silvery streaks or spots. Genus 12. Melitæa.

Larvæ spiny, or with fleshy tubercles furnished with spines.

Genus 11. Argynnis.

Antennæ with a short broad club; wings tawny, with longitudinal black streaks and spots; fore-wings with the hind-margin rounded or slightly concave; *hind-wings beneath with silvery streaks or spots.*

Larvæ spiny (the spines long or short), feeding on different species of violets in woods.

Of the six species, which may be distinguished as follows, the first three are only single-brooded, but the three latter *appear* double-brooded.

A. Under side of hind-wings with silver streaks. *A. Paphia.*

AA. Under side of hind-wings with silver spots.

B. Expansion of the wings above 2 inches.

C. Under side of fore-wings with no silver spots. *A. Adippe.*

CC. Under side of fore-wings with silver spots near the tip. *A. Aglaia* and *A. Lathonia.*

BB. Expansion of the wings under 2 inches. *A. Selene* and *A. Euphrosyne.*

A. Paphia. 2″ 6‴—2″ 11‴. *Fulvous, with black stripes and spots. U. s.—H.-w. greenish, with* a silvery hind-margin, and 1 long and 2 short *silvery* bands. VII—VIII.

Larva black, with 2 slender sulphur lines down the back, and several ochreous streaks on the sides; numerous spines, 2 long ones projecting over the head (*Freyer*). On *Viola canina* (dog violet). V e—VI b.

Generally distributed in woods in the South: also in Da.! Hu. Sc.! Y.!

A lovely insect when fresh from the chrysalis.

A. Adippe. 2″ 1‴—2″ 3‴. *Fulvous, spotted with black. U. s.—F.-w.* without *silvery spots; h.-w. greenish, with about* 20 *silvery spots;* the silver on the marginal spots indistinct; between the marginal and central rows is a row of small dull red spots, with blue centres. VII.

Larva reddish grey, with black dorsal spots on the 4th to 12th segments, and a white uninterrupted dorsal line; numerous spines (*Dup.*) On *Viola odorata* (violet) and *V. tricolor* (wild heartsease). V e—VI b.

Woods and heaths. Bl. Brg. Brs. Ct. Do. Ep. Lw. Ly.!! Pt. Pl. Sh.! St.! Te.! Y.!

A. Aglaia. 2″ 3‴—2″ 6‴. *Fulvous, spotted with black. U. s.—F.-w.* with *marginal silvery spots towards the tip; h.-w. greenish, with about* 20 distinct *silvery spots.* VII.

Larva blackish, with 2 pale yellow dorsal lines, and reddish lateral spots on the 5th to 12th segments; numerous spines, 2 at the head, short and projecting over (*Dup.*). On *Viola canina* (dog violet). V e—VI b.

Woods and heaths. Bl.! Brg.!! *Brs.!* Bu.! *Cr.* Ct. Da.! G.! I.! L.D. Lw. Le.!! Ly. Pl. Sc.! *Sh.* St.! Te.! Wt.! Y.!

A. Lathonia. 2″—2″ 1‴. *Fulvous, spotted with black. U. s.—H.-w. yellowish,* with a marginal row of 7 silvery spots, near which is a row of 7 dark brown spots, each with a silvery dot in the centre; *towards the base are 7 large brilliant silvery spots.* VI and IX.

Larva brownish, with whitish dorsal line and ochreous lateral line; spines, prolegs and head pale tawny (*Sepp.*) On *Viola tricolor* (wild heartsease). VIII b and ——?

Occasionally found in the South. Exeter. Colchester. Shoreham, in Kent. Harleston, near Norwich. Lavenham. Eastbourne. Dover. Bristol. Peterborough.

A. Selene. 1″ 7‴—1″ 10‴. *Fulvous, spotted with black. U. s.—H.-w. straw-colour marbled with brown,* more than one *large central silvery spot,* and a row of small black spots towards hind-margin. VI and s. VIII.

Larva black; spines paler; prolegs red (*Dup.*) On *Viola canina* (dog violet). VI and IX.

Woods and thickets. Bl.! Brg.!! Brs. Cr.! Do. Ep.!! Ex.! G. Ha.! L.D.! Lw.! Lc. Ly.!! M. Pm. Pl.!! Pr.! R. Sc. Sh.! St.! Te.!! Tn. Wr.!! Wt.! Y.! Sutton, near Birmingham. Pentland Hills.

A. Euphrosye. 1″ 8‴—1″ 10‴. *Fulvous, spotted with black. U. s.—H.-w. straw-colour marbled with reddish orange,* and with one *large central silvery spot.* V e, VI and s VIII.

Larva black, with a white lateral line, and 2 white dorsal lines approaching each other on each segment; prolegs red (*Dup.*) On *Viola canina* (dog violet). VI and IX.

Woods and thickets. Be. Bl.!! Brg.!! Brs. Bu.! Cr.! Ct.! Do. Ep.!! Ex.!! G.! Ha.! L.D.! Lw.! Lc.!! Ly.!! M. O.!! Pm.! Pt.! Pl.!! Pr.! Sc. Sh.! St.! Te.! Tn.!! Wa.!! Wi.! Wr.! Wt.! Y.! Near Richmond, in Yorkshire.

Genus 12. Melitæa.

Antennæ with a moderately long club; wings tawny, with *transverse black bands,* and longitudinal black streaks; fore-wings with the hind-margin rounded; hind-wings beneath straw-colour or yellowish, with darker margins, but *with no silvery spots.*

Larvæ with fleshy tubercles, furnished with spines; feeding on plantain and scabious. They emerge from the egg in autumn, live through the winter without eating, and become full-fed early in spring.

The three species, which at first sight seem very similar on the upper side, may be readily distinguished by an examination of the under side of the hind-wings, thus:—

A. Under side of hind-wings pale straw-colour, with *several rows of black spots*. *M. Cinxia.*

AA. Under side of hind-wings straw-colour, with several rows of short black *lines*. *M. Athalia.*

AAA. Under side of hind-wings yellowish, with orange bands, with *one row of* black *spots* near the hind-margin. *M. Artemis.*

M. Cinxia. 1″ 9‴—1″ 11‴. *Deep fulvous, tessellated with brownish black. U. s.—H.-w. pale straw colour*, with two fulvous bands edged with black, and *with* several rows *of small black spots*. VI.

Larva black, with 3 or 4 transverse rows of white dots on each segment; spines black; head and prolegs tawny (*Dup.*) On plantain (*Plantago lanceolata*). V.

Abundant in some localities in the Isle of Wight, especially near Sandown. Pt. St. and Falkland, in Fifeshire.

The extremely local character of the species of this genus renders the following account of the habits of *Cinxia* (quoted from the Rev. J. F. Dawson's communication to the 'Zoologist,' 1486, p. 1271) additionally interesting:—

"As this Fritillary is rare in almost every part of the kingdom, some account of its favourite haunts and habits may not prove uninteresting. It cannot be accounted by any means common here, being confined to a few localities only, though where it does occur it is in general to be found in some abundance. It is not to be expected in cultivated districts, but breeds on steep and broken declivities near the coast, which the scythe or the plough never as yet have invaded, and in such spots it may be met with early or later in May, according to the season. Near Sandown, on the side of the cliff, there is one of these broken declivities, occasioned by some former land-slip,

covered with herbage, which slopes down to the beach. A pathway leads to the base. On the 9th of May, 1844, a hot, sunny day, each side of this pathway was completely carpeted with a profusion of the yellow flowers of *Anthyllis Vulneraria* (var. *maritima*) when I visited the spot; and these flowers were the resort of an abundance of these Fritillaries, which fluttered about them or rested on their corollas, expanding and sunning their wings, and presenting a most charming picture of entomological loveliness. The great abundance of the narrow-leaved plantain, which also grows there, affords food for their larvæ. The spring of *last* year, on the other hand, was so very backward, that on visiting that locality at a date some fortnight later than the above, so far from either flowers or butterflies being visible, the larvæ were still feeding, and I could discover but few chrysalides. These latter are found adhering, just above the surface of the ground, to the knotted stems of the plantain, which here consists of aged plants, each with but a few stunted leaves; and occasionally on the under side of large stones, which have fallen from the cliff; and they are suspended and partly surrounded in the latter case with a fine web. They are also generally to be found in *pairs*. The caterpillars evidently prefer these stunted plants, for at the base of the declivity, where the plantain grows luxuriantly, not one is to be seen. They are black and spiny, with *red head and legs:* being hatched in August, they pass the winter in societies, under a kind of tent, formed by a compact web, brought round and over the stems of grasses. I have found several of these societies on the 27th of August, the individuals which composed them being about a quarter of an inch long, rolled up like little balls. All these societies occurred at the *base* of the declivity, where

the herbage grows most luxuriantly; and when the caterpillars have attained sufficient strength in the spring, they are invariably seen ascending towards the *higher* parts of the slope. And herein I imagine that I recognize a beautiful instance of natural instinct, both in the butterfly and caterpillar: the former deposits its eggs low down the declivity, where the young brood may rest most securely sheltered and least exposed to the wintry storms; but when the caterpillars are sufficiently advanced in growth they ascend to the higher parts of the steep, to feed and undergo their transformations: were the chrysalis formed *below*, they would probably have too much moisture and too little sun; whereas by being formed higher up they have a sufficiency of both to bring them to maturity.

"This butterfly is single-brooded; but there is a succession of them, varying in duration according to the season. The earliest dates on which I have met with it is May 1st, the latest in July; but in the latter case the specimens were bred in captivity. I never remember to have seen it so late in the state of liberty; not later indeed than the middle of June here. They are very difficult to rear from the larvæ, and those that I have bred are not only disclosed much later than in the state of freedom, but are not nearly so fine and perfect. They in general fly slowly and peacefully, except when alarmed, gliding gently from flower to flower. I have taken as many as two dozen without moving from the spot where I stood, as they successively visited the stems of the grasses round me.

"This Fritillary was much less plentiful last season than heretofore, and in some of its former haunts has quite disappeared. It has many foes: for besides the march of improvement in cultivation which gradually invades its haunts, the

same natural causes which promote its abundance also multiply its enemies. *Silpha obscura* and *tristis* destroy the larvæ; and a large ground spider, very numerous in the spots which it frequents, feeds on the perfect insect; it lies in wait till the butterfly alights upon the low plants or on the ground, then, rushing forward, seizes it by the neck, and holds it captive with such tenacity, that both insects may almost be pulled in pieces ere it will relax its grasp."

M. Athalia. 1″ 6‴—1″ 9‴. *Deep fulvous, tessellated with brownish black. U. s.—H.-w. straw-colour,* varied with fulvous and with several angulated black lines, but WITHOUT BLACK SPOTS. VI and VII.

Larva black, with numerous white dots; head and prolegs black; spines ferruginous (*Dup.*) On plantain (*Plantago major, P. lanceolata*), &c. V.

Only in the South. Heaths and open places in woods. *Ep.* Ha. Pl.! St. Te.! Tn.!!

Mr. Tress Beale gives the following account of the habits of *Athalia* in the neighbourhood of Tenterden:—"Chief locality, Knock Wood. They are generally congregated in one particular spot—an open heathy place, where the underground is of about one or two years' growth. The *metropolis* is mostly changed each year; for instance, I could point out four different places which have been occupied during the last four years. Stragglers are of course to be met with in other parts of the wood. They are fond of basking in the sun on thistles. When in the net they generally feign death, close the wings and contract the legs."

M. Artemis. 1″ 6‴—1″ 8‴. *Reddish fulvous, tessellated with brownish black. U. s.—H.-w. yellowish, with reddish*

orange markings, a band of which colour near the hind-margin contains A ROW OF BLACK DOTS in yellowish rings. VI.

Larva black; a lateral band of white dots; head and spines black; prolegs reddish brown (*Dup.*) On scabious (*Scabiosa succisa*), plantain (*Plantago*), also, according to Mr. Reading's observations, on foxglove (*Digitalis purpurea*), and germander (*Teucrium Scorodonia*). IV.

Moist meadows; local. Bl. Brg.!! Brs.!! Ct.! *Ep.!* Ex. G. Ha. K.! Lw. Lc. M.! Pt. St. Wi.! Wr. Y.! Carlisle. Charnwood Forest, near Burton-on-Trent. Weston-super-Mare.

Family III. ERYCINIDÆ.

Imago of the ♂ with only four legs fitted for walking, the ♀ with six legs; larva short and onisciform, rather hairy; pupa attached by the tail, and with a belt of silk round the body.

Of this family but one species occurs in Europe; it has in the perfect state considerable resemblance to the preceding genus, though much smaller in size; it is not by any means uncommon in open places in woods in the South of England at the end of May and beginning of June, and appears again, though more sparingly, in August.

Genus 1. NEMEOBIUS.

Antennæ slender, with rather short club; wings tawny, with darker markings; fore-wings with the costa and hind-margins straight, the apex hardly rounded.

Larva short, onisciform.

N. LUCINA. 1″ 1‴—1″ 3‴. *Blackish brown, with tawny spots;* on both sides *a marginal row of yellowish* or tawny spots, *each with a black dot in it.* U. s.—H.-w., 1 basal and 1 central band of white spots. V e—VI e.

Larva reddish brown, with similar tufts of hair; a darker dorsal line and black spiracles (*Dup.*) On the common primrose (*Primula vulgaris*) and other species. VI and IX.

In woods. Not uncommon in the South: rare in the North. Bl. Brg. Ct.! Ep. Ha.!! L.D. Lw. Ly.! O.! Pm. Pt. St.! Tn. Wi.! Wr. Wt. Bramham Park, near York. Clapham Park Wood, Beds. Dursley, Gloucestershire.

The larva has never been found in England.

Family IV. LYCÆNIDÆ.

Imago with six legs fitted for walking; larva short, oniscifform; pupa attached by the tail, and with a belt of silk round the body. Species mostly of smaller size than any of the two first Families.

This Family contains three genera, including eighteen species, rather more than a fourth of our butterflies. They have all short jerky flights, and many of the species never rise far from the ground, and are easy of capture: they frequent woods, meadows, heaths and chalk downs.

The first that greets us in the spring is *Polyommatus Argiolus*, not unfrequently observed in gardens in April, but most certain to be met with where much holly is grown. In the same month *Chrysophanus Phlæas* appears, and may be noticed settling on flowers in gardens, fields, lanes, &c. In the month of May the little Blues begin to appear more generally, and *P. Alexis* may be found in fields, lanes and gardens; *P. Adonis* in chalky situations, especially in waste places, such as old chalk-pits; *P. Agestis* also frequents the same localities. *Thecla Rubi* may be found on heaths and in open places in woods, and is very generally distributed. Many of these May species continue to be met with till June is far advanced, and at that time *P. Alsus* appears, but is more restricted in its localities, though generally in great

plenty where it does occur: it is an interesting species, being *the smallest British butterfly*. A second brood of *C. Phlæas* also appears in June. July produces three of the Hair Streaks, *Thecla Pruni*, *W-album* and *Quercus*; the two former are, however, excessively local, though the latter is tolerably generally distributed, frequenting oaks. Late in the month used to appear the largest of this Family, *C. dispar*, at one time found in the fenny parts of Cambridgeshire and Hunts. Two of the rarest of our Blues, *P. Acis* and *Arion*, both local species, are on the wing in July; *P. Ægon* is common in many places on heaths, &c., and Arthur's Seat is then the resort of *Artaxerxes*, which may also be found on the grassy slopes at the foot of several of the Scottish Hills. In August appears *Thecla Betulæ*, tolerably distributed over the southern portion of the island, and flitting along in hedges *just in advance* of the collector: the second brood of *T. Rubi* also now appears, and later in the month the first specimens of the last brood of *C. Phlæas* may be observed. Of the Blues, *Artaxerxes*, *Corydon*, *Adonis*, *Alexis* and *Agestis* furnish the collector with plenty of sport, and stragglers of *Artaxerxes* may be met with in its particular haunts. In September we find a great diminution of the species; except for *Thecla Betulæ* (generally then in a tattered state), *Chrysophanus Phlæas*, *Polyommatus Alexis* and *Agestis*, the season is fairly past. In October the only species to be noticed is *C. Phlæas*, which still, on sunny days, loves to sit on the flowers of the ragwort or scabious, its brilliant colours contrasting with the flowers on which it sits, and attracting the attention of many an un-entomological passer-by; more noticed then because so few other butterflies remain to claim a share of our regards.

Thecla Quercus and *Rubi* are both common and generally distributed, and have only to be looked for in their respective habitats. *Chrysophanus Phlæas* and *Polyommatus Alexis* are so abundant everywhere, that it is hardly necessary to *seek* for them. The only other Blue at all of general distribution is *P. Argiolus*. By visiting localities where other species occur (and some of my readers may be so fortunate as to be themselves residents in such localities), *Thecla Betulæ*, *Pruni*, *W-album* and *Polyommatus Alsus*, *Arion*, *Corydon*, *Adonis*, *Ægon*, *Agestis* and *Artaxerxes* may all readily be obtained. There will still remain, as *desiderata* to the growing collection, *Chrysophanus dispar* and *Chryseis* and *Polyommatus Acis;* and we are quite unable to indicate where these may now be obtained. If any fortunate collector stumbles on either of these species we shall be very glad to hear from him.

This Family contains but three genera, thus recognized:—

A. Hind-wings with short tails. 1. Thecla.
AA. Hind-wings without tails.
B. Wings coppery red. 2. Chrysophanus.
BB. Wings blue or brown. 3. Polyommatus.

Genus 1. Thecla.

Fore-wings *dull brown*, unicolorous or with a large blotch of some other colour, or with pale markings near the hind-margin; hind-wings tailed (except in *T. Rubi*), and with a transverse pale line on the under side (this line is either entire as in *Betulæ*, *W-album* and *Quercus*, interrupted as in *Pruni*, or almost obsolete as in *Rubi*).

Larva feeding on trees, shrubs or papilionaceous plants. All the species, except *Rubi*, single-brooded; of *Rubi* there are two broods in the year.

The five species may be thus recognized:—

A. Under side of the wings not green.
  B. Under side of hind-wings with *two* white slender streaks. *T. Betulæ.*
  BB. Under side of hind-wings with *one* white slender streak.
    C. Under side of hind-wings with an orange band near hind-margin.
      D. The orange band with a row of *black spots* on its inner side. *T. Pruni.*
      DD. The orange band with a *black line* on its inner side. *T. W-album.*
    CC. Under side of hind-wings with no orange *band* near hind-margin (only two small orange spots). *T. Quercus.*
AA. Under side of wings green. *T. Rubi.*

T. Betulæ (Brown Hair Streak). 1″ 6‴—1″ 8‴. *Rich brown. F.-w., ♂ with an* indistinct yellowish, ♀ with a distinct large *orange, patch beyond the middle;* h.-w., 2 or 3 distant orange spots towards the anal angle. *U.-s. ashy fulvous; h.-w. with 2 transverse white lines.* VIII.

Larva pale green, with distinct oblique white lines (*H. D. in litt.*) On *Prunus spinosa* (blackthorn), and *Betula alba* (birch). [? H. D.] VI e—VII b.

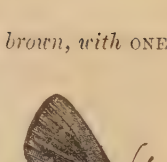
Hedgerows in the South. *Bl.* Brg. Ep. Ly. Pt. Te. *Tn. Wi.* Wr.

T. Pruni. 1″ 3‴—1″ 4‴. *Brownish black. H.-w.*— Three or four *orange spots in a row towards the anal angle. U.-s. brown; a central* bluish *white line crossing both wings,* waved near the anal angle of h.-w.; *h.-w.,* a row of black spots *on the inner edge of the marginal orange band.* VII.

Larva green, darker on the back; two rows of long yellow spots on the back, and a row on each side above the legs; six long oblique yellow stripes on each side (*Dup.*) On *Prunus spinosa* (blackthorn). V.

Plentiful at Overton Wood and Monks Wood, Hunts.

T. W-ALBUM. 1″ 2‴—1″ 5‴. *Blackish brown, with* ONE *orange spot at the anal angle of h.-w. U. s. brown; a central* WHITE *line crossing both wings,* and forming a white W near the anal angle of h.-w.; *h.-w.,* A BLACK LINE on the *inner edge of the marginal orange band.* VII.



Larva pale green, with short darker oblique streaks on the side; sometimes with two rows of reddish spots down the back, and a dull red stripe on each side above the feet (*Dup.*) On *Ulmus campestris* (elm). V e—VI b.

Brs. Ep. Pt. Y.

The following remarks of Mr. Stephens, published in 1827, have been frequently quoted, but are worthy of repetition here:—"This species is usually esteemed a scarce insect in the neighbourhood of London, and previously to the last season I never saw it alive; but the boundless profusion with which the hedges, for miles, in the vicinity of Ripley, were enlivened by the myriads that hovered over every flower and bramble-blossom, last July, exceeded anything of the kind I have ever witnessed: some notion of their numbers may be formed, when I mention that I captured, without moving from the spot, nearly 200 specimens in less than half an hour, as they successively approached the bramble-bush where I had taken up my position. How to account for their prodigious numbers I am perfectly unable, as the same fields and hedges had been carefully explored by me at the same and different periods of the year for several preceding seasons, without the occurrence of a single specimen in either of its stages; and it is worthy of remark, that the hedges to

the north and north-west of the village were perfectly free, although the brambles, &c., were in plenty."

T. Quercus (Purple Hair Streak). 1″ 2‴ — 1″ 6‴. *Blackish brown, tinged with rich purplish blue.* F.-w.— ♀ with a rich purplish blotch. *U. s. ashy grey; h.-w., 2 orange spots near the anal angle,* one of them being black-centred. VII and VIII.

Larva reddish brown, with 2 rows of short oblique black stripes on the back, the intervening space being paler; dorsal line black (*Dup.*) On oak. VI.

Generally distributed in the South: occurs in the North of England. Be.! Bl.! Brg.!! Brs.! Bu. Ep.!! Ex.!! L.D.! Lw.! Lc. Ly.! Pm.! Pt.! Pl.! Pr.! *Sc.* Sh.! St.! Te.! Tn.!! Wr.! Wt.! Y.!

I find the statement that the larva of this species frequently undergoes its transformations below the surface of the earth perfectly substantiated.

T. Rubi (Green Hair Streak). 1″—1″ 3‴. *Brown, without spots. U. s. green;* h.-w. with a central row of distant indistinct white dots. V e, VI and VIII.

Larva grass-green; dorsal stripe whitish; on each side a row of whitish spots, and a white line above the feet (*Och.*) On bramble and papilionaceous plants. VII.

Woods and heaths. Be. Bl.! Brs.! Ct.! Ep.! Ex.! G.! Ha.! *K.* L.D. Lw. Ly. M. O.! Pm.! Pt. Pl.!! Pr. Sh ! St.! Te.!! Tn. Wi.! Wr. Wt.! Y.! Dovedale, Derbyshire.

Genus 2. Chrysophanus.

Fore-wings *coppery red*, with dark hind-margin, and mostly with one or more black spots near the middle; hind-wings not tailed.

Larvæ feeding on sorrel and various species of dock. *C. Phlæas* has three (?) broods in the year; the other species are single-brooded.

The three species may be thus distinguished :—

A. Hind-margin of fore-wings blackish, or black with no purple tinge.
  B. Under side of hind-wings dull brown, with faintly darker spots. *C. Phlæas.*
  BB. Under side of hind-wings blue, with black spots. *C. dispar.*
AA. Hind-margin of fore-wings blackish, with a strong purple tinge. *C. Chryseis.*

No specimens of this last have occurred for forty years, and its claim to be considered a British species is doubted by many.

C. Phlæas (Small Copper). 1″ 1‴—1″ 4‴. *F.-w. bright copper-red, spotted with black,—hind-margin* blackish; h.-w. blackish, with a bright copper-red hind-margin. *U. s.—H.-w.* ashy brown, with faintly darker spots. V e—X b.

Larva green; a red dorsal line and a red stripe on each side (*Freyer*). On *Rumex acetosa* (sorrel). V, VII and IX.

Common everywhere.

C. Dispar (Large Copper). 1″ 7‴. *Bright copper-red with* 1 *or more black spots on each wing; hind-margins* black. *U. s.—H.-w.* pale *blue*, with distinct black spots. VII and VIII.

Larva green, with a darker dorsal stripe, and one paler stripe on each side (*Freyer*). On *Rumex hydrolopathum* (great water-dock) and *R. aquaticus*. VI.

Formerly Whittlesea Mere and Yaxley.

Concerning this species Mr. Bond writes me as follows :—"You are quite right in supposing that I have had personal acquaintance with living *Dispar*. I much fear that I shall

never have that pleasure again, as I am quite sure they have disappeared from the Cambridge and Huntingdonshire fens. All I can tell you about their habits is this,—that they were very active and shy, and would only fly when the sun shone; they would always settle on a thistle when they could find one in bloom, flying off to attack any insect, no matter what, that might come anywhere near them; not always returning, but generally passing on to another place. It was very little use following them if you missed your first stroke with the net, as they went away like the wind, and seldom let you get a second chance; indeed it was difficult to follow them, as keeping your eyes on them and the boggy places was rather a difficult job."

C. Chryseis. 1″ 4‴. *Bright copper-red; ♂ with a rich purplish blue tint near the hind-margins*, on the costa of f.-w. and on the inner margin of h.-w.; ♀ *dull copper-red, suffused with brownish black*. U. s. ashy. VIII.

Larva green, with a darker dorsal stripe, and 2 paler ones each side (*Freyer*). On *Rumex acetosa* (sorrel) and *R. obtusus* (dock). VI b.

Formerly taken near Epping, and in Ashdown Forest, Sussex.

Of this species Freyer writes in 1852:—"Several years ago I found the larvæ, for the first time, in a meadow, on the 25th May, while they were in the act of eating sorrel (*Rumex acetosa*). The metamorphosis takes place on the surface of the earth. The perfect insect appeared on the 16th June; it flies in June, in meadows near woods, and is fond of settling on the yellow flowers of *Trollius Europæus* and *Ranunculus acris*. It is not abundant, and in some years is not met with at all, although in the previous year it may have been no

rarity. It is very easily caught, since it seldom flies far, but goes merely from flower to flower."

Genus 3. Polyommatus.

Wings *blue, bluish or brown;* hind-wings not tailed; under side of all the wings with numerous black spots, generally surrounded by white rings (in *Artaxerxes* the black spots are omitted, the entire centre of the white ring being also white).

Larvæ feeding on papilionaceous and various other low plants. The larva of *P. Argiolus* feeds on the flowers of the holly and ivy. Many species are double-brooded, but of others there is only one brood in the year.

The ten species of this genus may be thus distinguished:—

A. Under side of wings with no red spots.
  B. Fore-wings with no black spots on the upper side.
    C. Under side of wings pale blue. *P. Argiolus.*
    CC. Under side of wings slaty grey.
      D. The black spots on the under side with *indistinct whitish* margins. *P. Alsus.*
      DD. The black spots on the under side with *distinct white* margins. *P. Acis.*
  BB. Fore-wings with six or seven black spots on the middle of the upper side. *P. Arion.*
AA. Under side of hind-wings with red spots at the hind-margin.
    E. Under side of fore-wings with two black spots before the middle.
      F. The whitish cilia interrupted with dark fuscous. *P. Corydon* and *P. Adonis.*
      FF. The whitish cilia entirely free from fuscous streaks. *P. Alexis.*
    EE. Under side of fore-wings with no black spots before the middle.
      G. Under side of hind-wings with three or four bluish metallic spots near the hind-margin. *P. Ægon.*

GG. Under side of hind-wings with no bluish metallic spots near the hind-margin.

H. White spots of the under side with black centres. *P. Agestis.*

HH. White spots of the under side with no black centres. *P. Artaxerxes.*

P. Argiolus. 1″ 2‴—1″ 5‴. *Lilac-blue. F.-w.* sometimes *tinged with blackish towards the hind-margin. U. s. pale silvery blue;* f.-w., a marginal row of oblong black spots. V and VIII.

Larva yellowish green, with a dark green dorsal line *(Och.)* On flowers of *Ilex Europæus* (holly), *Rhamnus Frangula* (buckthorn) and *Hedera Helix* (ivy). VI and X.

Generally distributed in the South, and occurs at Hu. L.D.! M. and Y., but not in Scotland.

P. Alsus. 8‴—1″. *Dull brown, faintly shot with blue. U. s. pale ashy grey,* faintly tinged with light blue; a marginal row of round black spots in whitish rings on each wing. V e—VI e and VIII?

Larva green, with an orange dorsal line, and a row of short oblique orange streaks on each side (*Dup.*) On *Astragalus?* V.

Principally on chalk and limestone. Brg.! *Brs.* Ct. Do. *Ed.* Ha. L.D.! Lw.! Pl. Te.! Wi. Wt.! Dovedale, Derbyshire. Isle of Portland and Tadcaster.

P. Acis. 1″ 2‴—1″ 4‴. ♂ *dark purplish blue, with a narrow brown margin;* ♀ brown. *U. s. pale greyish brown,* bluish at the bases; a marginal row of black spots in white rings on each wing. VII.

Larva unknown.

Mr. Newman writes;—"*P. Acis* is common in Herefordshire. I used to take it in my father's fields at Leominster twenty-five years ago. I have repeatedly seen it since, and

suppose it to be as abundant as ever." The Rev. Jos. Greene took "two specimens (not good) of this rare species in a chalky field near Lower Guiting, on the Cotswolds, the beginning of July, 1849."

Mr. Allis writes me:—"I know of no captures within the last seven years. The Birmingham collectors used to take it in plenty, but none have occurred recently that I know of."

P. Arion. 1″ 5‴—1″ 7‴. *Deep rich blue. Centre of f.-w. spotted with black;* hind-margins broad and blackish. U. s.—Each wing with 3 rows of black spots, and without red spots. VII.

Larva unknown.

Barnwell Wold, Northamptonshire.

The following passage is extracted from a communication made to the 'Zoologist' for 1852 (p. 3350), by the Rev. William Bree, of Polebrook;—"The great prize of all the butterflies of our neighbourhood, however, I hold to be *Polyommatus Arion*, which, if I mistake not, was first discovered here by myself some thirteen or fourteen years since. It is confined entirely, as far as my experience goes, to Barnwell Wold and the adjoining rough fields, with the exception of a single specimen which I once met with in a rough field near Polebrook. Its flight is somewhat peculiar, being different from that of others of the same genus, and more resembling that of *Hipparchia Pamphilus* and *Tithonus*. Independently of its manner of flight and size, it is in most instances easily distinguished on the wing from the other Blues by its dark and irony appearance. Many entomologists have of late years visited Barnwell Wold in search of *Arion;* in short, a summer never passes without meeting in my rambles with brother

entomologists from distant parts of the country: I rejoice, however, to be able to state that its annual occurrence does not appear to be diminished in consequence." Since the above was written, the insect has apparently really become less abundant.

P. Corydon. 1″ 3‴—1″ 6‴. ♂ PALE SILVERY BLUE; ♀ light brown. *U. s.—H.-w.*, ♀ A DISTINCT *black spot in a white blotch* near the middle, FAINTLY VISIBLE *on the upper* side; a row of red spots towards the hind-margin. Fringe chequered. VII e—VIII e.

Larva green; 2 rows on the back, each consisting of 8 short yellow streaks, and a yellow stripe on each side above the feet (*Freyer*). On species of vetch. V—VI.

On the chalk. Be. Brg. !! Brs. !! Ha. !! Lw. ! Pt.

P. Adonis. 1″ 4‴—1″ 6‴. ♂ BRIGHT SMALT-BLUE; ♀ brownish slate-colour. *U. s.—H.-w.*, ♀ *an* INDISTINCT *black spot in a white blotch* near the middle, NOT VISIBLE *on the upper side;* a row of red spots towards the hind-margin. Fringe chequered. V and VIII.

Larva dark green, with 2 rows on the back, each consisting of 12 short yellow streaks, and a yellow stripe on each side (*Freyer*). On various papilionaceous plants (*Och.*) V—VI.

On the chalk and limestone. Be. Brg. !! Brs. Do. ! Ha. ! I w. and Torquay.

The first real difficulty of the butterfly-collector consists in the discrimination of the females of this and the preceding species: the males can always be readily distinguished by the great difference in the ground-colour of the upper surface of the wings. *Adonis* well deserves its name, and is the most splendid *Blue* we have. *Corydon*, however, has a peculiar beauty of its own; it reminds one of the soft silvery appearance of moonlight, whilst *Adonis* recalls the intense blue of the sky

on a hot summer's day. These gay colours are confined to the males; the females are clothed in sober garbs of brown. *Corydon* boasts of a more or less distinct black spot on the *upper surface* of the hind-wings; this in *Adonis* we seek for in vain; and, besides, in *Corydon* we find the dark dashes in the white fringes broader and more conspicuous than in *Adonis*. A fainter point of distinction is, that the black spots of the under side are more conspicuous in *Corydon* than in *Adonis*.

If any entomologist discovers some better point of distinction we shall be happy to hear from him.

P. Alexis (Common Blue). 1″ 2‴—1″ 5‴. ♂ *lilac-blue;* ♀ lilac-blue tinged with brown; a marginal row of indistinct orange spots. *U. s.—F.-w. ashy brown; 2 black spots in white rings between the central spot and the base of the wing.* U. s.—H.-w., a row of red spots towards the hind-margin. Fringe white, unchequered. V e—VII b and VII e—IX e.

Larva green, with a darker dorsal line, and a row of white spots on each side above the feet (*Dup.*) On clover and bird's-foot trefoil (*Lotus corniculatus*). IV and VIII.

Abundant everywhere.

P. Ægon. 1″ 1‴—1″ 2‴. ♂ *purplish blue,* hind-margins brown; ♀ brown, sometimes with a purplish blush. F.-w.—♀ spotless. *U. s.—F.-w., no spot between the central spot and the base of the wing.* U. s.—H.-w., a row of red spots towards the hind-margin. VII and VIII.

Larva brown; 2 rows of oblique white lines near the dorsal line, and a white line on each side (*Freyer*). On vetches. V.

On sandy heaths and chalky downs. Bi. Bl.! Brg. Brs. Ep.!! Lw. Ly.!! M.! Te. Y.! Brandon, Suffolk.

P. Agestis. 1″—1″ 1‴. *Rich brown, with a marginal band of orange spots.* F.-w., a central black spot. *U. s.—White spots,* with *black centres;* f.-w., no spot between the central spot and the base of the wing. V and VIII.

Larva green, with a pale angulated row of dorsal spots and a central brownish line (*Westw.*) On *Erodium cicutarium* (heron's-bill). IV and VII.

Only in the South. Be.! *Bl.!* Brg.!! Brs.! Ct.! Do. Ep. Ex. Ha.!! Lw.! Pt.! Pl. Sh. Te. Tn. Wi.!

A singular variety, with a white spot on the upper side in centre of fore-wing, was taken near Brighton last July, by Mr. H. Cooke. The under side entirely agreed with the ordinary appearance of *Agestis*.

P. Artaxerxes. 1″ 1‴—1″ 2‴. *Rich brown, with a* more or less distinct *marginal band of orange spots. F.-w., a white central spot. U. s.—White spots* without *black centres.* VI and VII.

Larva "pale bluish green, with a dark green dorsal line and a pinkish lateral one; head glossy black" (*Logan* in litt.) On *Helianthemum vulgare* (common sun cistus). V.

Castle Eden Dene, and Richmond, Yorkshire. Arthur's Seat, Edinburgh. Fifeshire, and other Scotch localities.

Mr. Logan writes me that this year he has not seen the larva, and that he has seen but very few of the imago, adding: —"*I* have not diminished their numbers, having always a wholesome dread of exterminating species; but I believe *a dealer* has, and a host of small boys who come out of Edinburgh, with *orange*-coloured nets, and bottle them up wholesale, *five or six together, alive,* in the same receptacle, generally a match-box, along with Blues and anything else they can find.

"This is one of the evils attendant on boys beginning too early, before they can understand what they are about. Their object seems to be, like that of sportsmen, to obtain as many as they possibly can, no matter in what condition. Unfortu-

nately, the *Artaxerxes* when at rest is very conspicuous, and becomes an easy prey to these little marauders, whom I would wish to encourage if it were possible; but they are just at the age when their destructive energies are with difficulty to be restrained.

"In addition to all this, Government has agreed to construct a carriage-road between Edinburgh and Duddingston, much to my disgust, as it is to come along the line of the present footpath, and will destroy all the best localities for *Artaxerxes*, *Obelisca*, &c."

Family V. HESPERIDÆ.

Antennæ inserted on each side of the broad head (thus *widely* separated at their insertion, in comparison with the other Families of butterflies); both sexes furnished with six legs of uniform size; body comparatively robust; larvæ elongate, the head large and the following segments narrowed; they inhabit rolled-up leaves; pupa enclosed in a more or less transparent cocoon.

This Family is represented in Britain by four genera, comprising seven species; all are of small size, the largest not exceeding one inch and four lines; their flight is short and jerking, whence they have obtained the appellation of "Skippers."

The earliest to appear are *Thymele Alveolus* and *Thanaos Tages*, which are to be met with during the month of May, the former in moist localities near woods, the latter on dry chalky or sandy hill-sides: this, from its dull *dingy* colour, is not very easily observed when on the wing; but the gay

little *Alveolus*, with its quadrate whitish spots on the greenish black wings, very readily attracts attention. At the end of the month *Pamphila Sylvanus* makes its appearance: this seems to be a very generally distributed species, and it may generally be found in country lanes or by the edges of woods, settling abruptly on flowers, and, as the collector approaches, *skipping* a few paces farther off. In June the local *Steropes Paniscus* appears, and, though generally in profusion where it does occur, the collector can hardly expect to fall in with it unless he makes an excursion to a known locality of the species. Towards the end of July *Pamphila Sylvanus* again appears, and is then joined by its congener, *P. Linea*, which is equally common in most localities. In August *P. Sylvanus* still continues on the wing, and the pretty *P. Comma* is ound abundantly in various localities on chalk, limestone and sand. It is this month that Lulworth Cove, Dorsetshire, is resorted to by those in want of *Pamphila Actæon*, which has hardly occurred elsewhere in this country (if we except the locality of Shenstone, near Lichfield, assigned by Mr. Humphreys, who, when he there found the insect, reputed it merely *Linea*). In August, too, the second brood of *Thanaos Tages* is of regular occurrence, and that of *Thymele Alveolus* is sometimes met with.

Thus the young collector may expect to meet with *Alveolus*, *Sylvanus* and *Linea* his first season, and, if he moves about a little, has a fair chance of finding *Tages* and *Comma*. *Paniscus* and *Actæon* he must not expect to meet with, unless he makes a pilgrimage to their respective shrines for the purpose of personally cultivating their acquaintance.

The four genera of the Family may be thus distinguished :—

A. Fore-wings with quadrate whitish spots upon a blackish ground. Genus 1. THYMELE.

AA. Fore-wings dull greyish brown, with darker bands. Genus 2. THANAOS.

AAA. Fore-wings tawny or spotted with tawny.

B. Hind-wings blackish brown, with *distinct pale* tawny spots. Genus 3. STEROPES.

BB. Hind-wings tawny, more or less suffused with fuscous; if with tawny spots, the spots are *neither pale nor distinct.* Genus 4. PAMPHILA.

Genus 1. THYMELE.

Antennæ short, not terminating in a hook; fore-wings with rounded hind-margin; hind-wings not emarginate near the anal angle; *wings dark, with whitish spots,—fringes chequered.* Wings in repose *erect?*

We have but one species of this genus, which seems pretty generally distributed.

T. ALVEOLUS. 1″—1″ 1‴. *Blackish,* tinged with green and *chequered with* somewhat *square creamy white spots.* V and s VIII.

Larva green or brown, with a dark dorsal line, 2 white lines on the back, and a white line on each side; head brownish black (*Hub.*) On *Rubus Idæus* (raspberry). IV.

Moist places near woods. Bl.! Brg.!! Brs.!! Cr. Ct.! Ep.!! Ex.! G.! Ha.! K. Lw.! Ly.!! O.!! Pm.! Pt. Pl. Sh.! St.! Te.! Tn.!! Wa. Wi.! Wr.! Wt.! Y.!

Genus 2. THANAOS.

Antennæ rather short, yet longer than in the preceding genus, not terminating in a hook; fore-wings with rounded

hind-margin; hind-wings not emarginate near the anal angle; *wings dark, with darker bands,—fringes unicolorous.*

Wings in repose *horizontal.*

This genus, like the preceding, contains but one British species.

T. Tages. 1″—1″ 3‴. *Dull brown*, with a marginal row of pale dots. *F.-w. with 2 rather indistinct darker bands.* V and VIII.

Larva pale green, with 2 yellow lines on each side, and a row of black spots above each (*Dup.*) On *Lotus corniculatus* (bird's-foot trefoil). VI and IX.

Dry places, slopes of hills, &c. *Be. Bi.* Bl! Brg.!! Brs.!! Cr. Ct.! Da. Ep.! Ex.! G.! Ha.! Hu.! K. L.D.! Lw.! Ly.!! M. O.! Pm.! Pt. Pl. Pr.! Sc.!! Sh.! St.! Te.! Tn. Wa. Wi.! Wt.! Y.! Broomsgrove and Dovedale.

Genus 3. Steropes.

Antennæ not hooked at the tip; fore-wings rather long and pointed; hind-wings *not emarginate* before the anal angle; *wings brown, with orange spots.*

Wings in repose *erect.*

We have but one species in this genus, which, though abundant where it occurs, appears extremely local.

S. Paniscus. 1″ 1‴—1″ 2‴. Rich *dark brown*, chequered *with orange*-tawny *spots.* U. s. similar, but paler. VI.

Larva brown, with 2 yellow dorsal stripes; head black; second segment edged with yellow (*Dup.*) On plantain (*Plantago major*). IX.

A very local species. Castor Hanglands, near Peterboro', and Monks Wood, Hunts; Stowmarket; and Bourne, Lincolnshire.

Genus 4. Pamphila.

Antennæ *sometimes hooked* at the tip; fore-wings, in the males rather pointed, and with an indentation in the hind-margin; *hind-wings emarginate towards the anal angle;* wings tawny, with darker markings: the males of all the species with an oblique black patch from the middle of the inner margin of the fore-wings.

Fore-wings in repose *elevated; hind-wings horizontal.*

We have four species in this genus, one of which, *Actæon*, excessively local; they may be thus recognized:—

A. Antennæ not hooked at the tip.
  B. Fore-wings dull dark tawny, with a paler curved mark beyond the middle. *P. Actæon.*
  BB. Fore-wings bright tawny, with no paler marks. *P. Linea.*
AA. Antennæ hooked at the tip.
  C. The spots near tip of fore-wing not paler than the other fulvous blotches. *P. Sylvanus.*
  CC. The spots near tip of fore-wing *whitish* fulvous. *P. Comma.*

P. Actæon. 1″—1″ 1‴. *Dull* rich *brown*, shot with fulvous. F.-w.—♂ *with* an indistinct paler, ♀ with *a* distinct *fulvous, stripe from the base to the centre, beyond which is a curved row of fulvous spots.* VIII.

Larva unknown. Professor Zeller saw a ♀ lay eggs on *Calamagrostis epigejos* (wood reed).

A very local species. Lulworth, Dorsetshire, and Sidmouth, Devonshire; and Mr. Humphreys states that he met with it in great abundance in 1835 at Shenstone, near Lichfield.

Mr. Douglas has given me the following note of his experiences of this insect in Dorsetshire:—

"In July, 1849, my late friend H. F. Farr was staying at Weymouth for the benefit of his health, then fast declining,

by reason of the malady which not long after caused his death. I staid a few days in his company, and made some entomological excursions with him to Portland and other places adjacent; for, although he was weak, his love of insects clung to him still. One bright sunny morning we hired a boat owned by one of the amphibious long-shore dwellers, whom we took with us, and found he was a character, and could turn his hand and his tongue to anything. An hour's sail across Weymouth Bay, during which we amused ourselves by catching mackerel, brought us to the desired spot, 'the Burning Cliff' (or Lulworth Cove), where we had been told we should find *Pamphila Actæōn*, and there, sure enough, we saw it in profusion. The spot, close to the sea, is a kind of undercliff, not very level, of no great extent, and covered with thistles and large tufts of a long coarse grass or *Carex*, about which our prey were skipping briskly. So abundant were they that I often had five or six in my net at one stroke, and in about two hours I caught a hundred, filling my box and my hat; and Mr. Farr had nearly as many. They were accompanied by a few of the common *P. Linea*, which, in their flight, they greatly resembled. My ungeological eyes detected nothing particular in the soil, and I confess that two hours' hard work in the sun had not disposed me to look if any particular plant which might serve as the food of the larvæ of this Skipper grew there; so that I can offer no supposition as to the cause of the species being confined within such narrow limits in this country."

P. Linea. 1″ 1‴—1″ 3‴. *Fulvous*, shot with brown; *without any paler markings*. VII.

Larva green, with 2 white dorsal lines, and 2 white lines on each side (*Dup.*) On grasses. VI.

Appears very generally distributed. Be.! Bl.! Brg.!! Brs. Bu. Ct.! Do. *Ed.* Ep.!! Ex.! Ha.! K. Lw.! Lc. Ly.! Pm.! Pt. Pl.!! Sh.! St.! Te.! Tn.! Tr. Wa. Wi.! Wr.!! Wt.! Y.!

P. Sylvanus. 1″ 2‴—1″ 4‴. *Rich brown, with* numerous indistinct *fulvous blotches and spots. U. s.* INDISTINCTLY *spotted.* V and VIII.

Larva dull green, with darker dorsal line; dotted with black; head brown; beneath, on the 10th and 11th segments, are snow-white transverse spots (*Zeller*). On *Holcus lanatus* (meadow soft-grass) and other grasses. V b.

Appears very generally distributed. Be.! Bl.! Brg.!! Brs.!! Bu. Ct.! Da. Do. Ed.! Ep.!! Ex.!! Ha.! K.! L.D.! Lw.! Lc. Ly.! M. Pm.! Pt.! Pl.! Pr.! R. Sc.! Sh.! St.! Te.!! Tn.! Wa.! Wi.! Wr.!! Wt.! Y.!

P. Comma. 1″ 2‴—1″ 4‴. *Rich brown, blotched and spotted with fulvous;* the spots towards the tip of f.-w. WHITISH fulvous. *U. s.* GREENISH, *with* SQUARE WHITE *spots.* VIII.

Larva dull green mixed with reddish; second segment white; 2 white spots near the bottom of the 9th and 10th segments (*Dup.*) On papilionaceous plants. VI e—VII m.

A local species, generally plentiful where it occurs. Bl. Brg.!! Ha.! Lw.! Ly.! Pl. Sc.!

Having now brought the list of British butterflies to a close, we cannot do better than call attention to the amount of observation which is still necessary to enable us to become *well acquainted* with the natural history of each species.

One of our very first observant entomologists wrote in July last, "I never saw the larvæ of *Phlæas*, nor of any of the Hesperiæ." It will be observed that in the preceding

descriptions of larvæ the greater number are made from the descriptions of the previous authors severally referred to; for, though last summer we early called the attention of our correspondents to our wish to see any larvæ of our British RHOPALOCERA for description, but very few of them had personal acquaintance with any but the very commonest species.

A recent writer in the 'New Quarterly Review' has remarked:—"The metamorphoses of the British butterflies, of which there are only about sixty-five, are proportionably less known than those of the small moths! The books which describe our butterflies, it is true, also give descriptions of their caterpillars and their food; but these cannot be depended upon: they are only copied from other books, and may be traced back from author to author, until they turn out to be the original descriptions of some old French, Dutch or German entomologist, who looked at objects with a very different eye to that which we use. As such, they remind us rather of the astonishment expressed by Mr. John Robinson's friend on finding he was really alive:—

> "'Somebody told me that some one said
> That some other person had somewhere read
> In some newspaper you were somehow dead!'"

Our readers are therefore recommended to catechize themselves, by seeing how many of the following questions they can answer, with reference to those butterflies with which they may consider themselves best acquainted:—

1. Where is the egg laid?
2. How soon is it hatched?

3. How long does the larva live before changing its skin?

4. What change takes place in the form and markings of the larva when it changes its skin?

5. Is the larva gregarious or solitary?

6. Is it active or sluggish?

7. Does it feed by night or by day?

8. What is its principal food-plant?

9. On what other plants is it sometimes found?

10. At what period is the larva full fed?

11. What change takes place in the appearance of the larva when full fed?

12. Where does it change to pupa?

13. How is the pupa suspended or attached?

14. What is the form of the pupa?

15. How long does it remain in that state?

16. What are the motions of the perfect insect?

17. To what flowers is it most partial?

18. Does it hybernate or not?

When these questions can be answered with reference to each species of our butterflies, we may then admit that their natural history *is* known; and it would then become practicable to write a good monograph of the group.

Having now come to the end of the Butterflies, our next consideration is the Moths. These are not by any means so easily disposed of as the Butterflies; for, whereas of the latter we had only sixty-six species to consider, the number of species of British moths will probably fall little short of two thousand by the time we reach the end of this little Manual; for not a year passes without the discovery of several species in this country which were previously unknown as British. Indeed, it is this continual addition of new species to our lists that has called forth so hearty a reception for the 'Entomologist's Annual,' it supplying to the isolated provincial collectors a want that had long been felt as an incubus on the study they were pursuing.

It will be naturally imagined that to ascertain the name of a moth is by no means so easy an affair as the discovery of the name of a butterfly, on account of the much greater number of species that have to be considered.

The first process must of course be to ascertain to which of the groups of moths the species the collector has in hand must be referred.

Moths, from the antennæ not terminating in a club, are termed HETEROCERA, and are divisible into nine groups, thus:—

1. Sphingina, consisting of the Sphinges or Hawk Moths.
2. Bombycina, including the Ghost Moth, Goat Moth, Emperor Moth, and Tiger Moths.
3. Noctuina, comprising the bulk of the nocturnal or stout-bodied moths, such as the Yellow Underwing, Wainscots, Silver Y, and Red Underwing.

4. Geometrina, consisting of an extensive group of slender-bodied moths, with comparatively large wings, such as the Thorns, Carpets, Waves and Pugs.
5. Pyralidina, including the Pearls, Veneers or Grass-Moths, and Knot-horns.
6. Tortricina, consisting of a very extensive group of small species, generally of dull colours, such as the *Lozotæniæ*, *Sciaphilæ*, &c.
7. Tineina, comprising the Clothes-Moths, Long Horns, *Depressariæ* or Flat-bodies, *Coleophoræ* and *Nepticulæ*, &c.
8. Pterophorina, consisting of the Plume Moths.
9. Alucitina, consisting of only one British species, the Twenty-Plume Moth.

The Sphingina are distinguished at a glance from the other eight groups by the form of the antennæ, these organs being thickest in the middle, and attenuated towards the base and towards the tip; in the remaining groups the antennæ are thickest at the base, and gradually taper towards the tip; so by an examination of the antennæ we can at once decide whether the insect we have before us belongs to the Sphingina or not.

But supposing we decide that it is not one of the Sphingina: we have then to determine to which of the remaining groups it is to be referred.

The first question that occurs is, Are the wings entire or divided? If divided, that is, if each wing is slit up into several pieces, it belongs either to the Pterophorina or to the Alucitina; to the former, if the fore-wings have one slit and the hind-wings two; to the latter, if each wing has five slits, in this way consisting of six separate feathers.

But supposing the antennæ show that our species is none of

the SPHINGINA, and at the same time the wings are not divided: in this case it may belong to any of the groups from No. 2 to No. 7 inclusive.

Examine therefore the length of the fringes; if these are comparatively long for the size of the wings, such as we find them in a Clothes-Moth, for example, the insect should probably be referred to the TINEINA group. And let not the reader be startled at the word *probably:* it is impossible, in the present state of our knowledge, to lay down *fixed, certain* rules by which, with hardly any trouble, to ascertain to which group of moths a species should be referred. Some of the PYRALIDINA have the fringes of such length, that by that character alone it is impossible to determine to which of the groups a species should be referred.

If the fringes are not comparatively long, we reduce the number of families in which we have to search for the proper position of our specimen still further; then are the wings ample, that is, nearly as broad as long? and what is the form of the body?

If the body be thick, rather short, and rather blunt behind, and the wings are broad, the insect may be assumed to belong to the BOMBYCINA; but if the body be moderately thick, rather pointed behind, and the wings not broad in comparison with their length, it may be suspected to be one of the NOCTUINA; whereas, if the body be slender and the wings broad, it in all probability belongs to the GEOMETRINA. If the wings be long and triangular, and the body slender and rather long, the inference would be strong that the insect should be referred to the PYRALIDINA; on the other hand, if the wings are rather broad, the fore-wings almost straight on the hinder margin, and

the costa at the base suddenly convex, the insect may be presumed to belong to the TORTRICINA. Exceptions occur to all these rules, which can only be learnt by a little practice; but, for the assistance of our readers, the exceptions shall be put prominently forward at the commencement of each group or family.

SPHINGINA.

The Sphinges or Hawk-moths are divisible into four very distinct families, viz.:—

1. ZYGÆNIDÆ, including the Foresters and Burnet Sphinges.
2. SPHINGIDÆ, including the Poplar Hawk, Privet Sphinx, Death's Head, Elephant Sphinges, &c.
3. SESIIDÆ, containing the Humming-Bird Sphinx and Bee Sphinges.
4. ÆGERIIDÆ, including the Clear-winged Sphinges (excepting the Bee Sphinges).

The ZYGÆNIDÆ are at once known by their small size and green or green and red fore-wings; the SPHINGIDÆ, on the other hand, are distinguished by their large size, the Death's Head, *Sphinx Convolvuli* and Privet Sphinx being our three largest Lepidopterous insects; and the smallest of this family, *Chærocampa porcellus*, is larger than any species in the other families; the SESIIDÆ (though by some authors included in the Sphingidæ) are recognised by their thick bodies and shorter fore-wings: the ÆGERIIDÆ are at once known by the transparent wings and narrow fore-wings, and bodies much more slender than in the preceding family.

The larvæ of all the SPHINGINA have 16 legs; those of the ZYGÆNIDÆ are fat and rather soft, without any caudal horn; those of the SPHINGIDÆ are firm and hard, with a distinct caudal horn (excepting in *Chærocampa porcellus*); the larvæ of the SESIIDÆ resemble those of the preceding family; the larvæ of the ÆGERIIDÆ, from their mode of feeding in the pith and wood of trees, differ essentially from all other larvæ of this group—they are dull whitish and with no caudal horn.

That the Sphinges, in proportion to their number, attract an unusual amount of attention, is in no way surprising; their large size, rapid movements and the splendour of many of their larvæ, constitute them, as it were, the Comets of the insect-collector. Many an entomologist probably looks back to the time when he first saw the larva of the Privet Sphinx as an event in his life: it is not unlikely that that larva has been the spark to fire many a country idler with the desire to study so beautiful an animal, and if this be so, we can well excuse the larva for holding its head so high.

The Death's Head has, on many accounts, been an object of interest: its powers of squeaking, its habit of entering bee-hives, and its capability of terrifying the bees, have been the subject of numerous experiments. But the only samples of this tribe which may be readily observed by the uninitiated are the Burnets and Foresters, occurring in June and July in meadows and chalk downs, and grassy slopes of hills, and the Humming Bird Sphinx, which sometimes is a common visitor in gardens. I have seen them in Devonshire, half-a-dozen at a time, sucking the honey from the tubular flowers, without ever resting in their aërial flight.

Many of the Sphinges are only occasional visitors with us, and others, though certainly naturalized here, are of extreme rarity.

Family I. ZYGÆNIDÆ.

Imago with the antennæ slender at the base, much thickened beyond the middle with scales only, or pectinated, never terminating in a hook; wings clothed with scales; fore-wings

narrow; hind-wings rounded; larva fat, sluggish, soft, with no caudal horn.

The perfect insects fly by day.

Of this family we have two genera, comprising six species; they are sluggish insects throughout life—the sluggish larva produces a sluggish imago: on this account they are rather local—they will swarm in one meadow, and hardly a straggler will be found in an adjoining field. The metropolis of this tribe is the shores of the Mediterranean, and therefore it is not strange that they are but poorly represented here, but it may be reasonably expected that a few more species may yet reward the efforts of the energetic collector.

None of this family appear in the perfect state before June, and the last stragglers are *passé* in September: the principal months for them are June and July. Then *Procris Statices* may be found in meadows, and *Procris Globulariæ* on the slopes of the downs at Lewes; whilst *Anthrocera Filipendulæ* occurs, like a true cosmopolite, in midland meadows, on chalk downs, on sand-hills by the sea, and high up the heathery hills of Scotland, where it is a pleasant sight to see them booming along with their peculiar heavy flight, reminding one, at first sight, of a humble-bee: the other Burnets are less widely distributed, and *Anthrocera Minos* has not been found on this side of St. George's Channel, coming to us from the "far west" of Galway, from a quarter where no doubt much remains to be done entomologically.

The young collector may reckon with some confidence on obtaining *Filipendulæ* during his first year, but the other species are so much more local that it is only by visiting some of their especial localities he can expect to find them. I had collected years before I met with *Statices*, and, except the two

species above mentioned, to this day have never seen any other of this family alive.

The family ZYGÆNIDÆ contains two genera, thus recognised at a glance:—

A. Fore-wings green, spotless; hind-wings smoky brown. Genus 1. PROCRIS.
AA. Fore-wings green with red spots or streaks; hind-wings red. Genus 2. ANTHROCERA.

Genus 1. PROCRIS.

Imago with the antennæ of the male pectinated, of the female dentate; the wings entirely without markings; abdomen not thick.

Larva of an oval form, contracted, slightly pubescent. Pupa enclosed in a cocoon.

The larvæ of this genus are full-fed at the end of spring, and the perfect insects appear in June.

The two species may be thus distinguished:—

A. Tip of antennæ blunt. *P. Statices.*
AA. Tip of antennæ pointed. *P. Globulariæ.*

P. STATICES (Forester). ♂ 1″ 1‴—1″ 2‴. ♀ 11‴—1″. *F.-w. bluish green;* h.-w. smoky brown. Tip of antennæ BLUNT. VI b—VII e.

Larva ashy grey, with a row of triangular black marks on the back; a narrow whitish stripe on the side above a broader reddish stripe; head and fore-legs black (*Hub.*) On sorrel. V—VI b.

Brg.!! *Brs.!!* Bu.! Ca.! Ct.! Da.! Do. Ep.! Ha.! Hu. K.! L.D.! Lw. Lc.!! M. O.! Pr.! St.! Wa.! Wi.!! Y.!

P. GLOBULARIÆ. ♂ 1″ 1‴—1″ 2‴. ♀ 9‴—9½‴. *F.-w. bluish green;* h.-w. smoky brown. Tip of antennæ POINTED. VI m—VII m.

Larva blackish, with a row of triangular green spots on the back; and a blue stripe on each side, in which is a row of yellow dots (*Hub.*) Food (in this country) unknown. V—VI.

Brg.!! Lw.!! also near Cheltenham.

Mr. Unwin, of Lewes, has sent me the following notice of this species:—"Local and gregarious; an insect of very short duration, and very sluggish; about the 14th or 15th of June is its usual time of appearance, and it is quite necessary to observe this, or you will not obtain them in fine condition, and probably may be disappointed in finding it, whereas, by visiting its localities regularly and punctually, at this period, you may almost make sure of specimens in ordinary years. Its localities are 'Bible Bottom,' on Cliffe Hill, near Lewes; near the Spittal Mill, Lewes, on a slope facing the west; and in a valley at the foot of Hollingbury Hill, near Brighton."

Genus 2. Anthrocera.

Imago with the antennæ (of the male not pectinated) much thickened beyond the middle; fore-wings elongate, green, with red streaks or spots; hind-wings red, with dark margin; abdomen thick.

Larva fat, cylindrical, slightly pubescent. Pupa enclosed in a tough cocoon, pointed at each end.

The larvæ of this genus feed exclusively on papilionaceous plants; they are hatched at the end of summer, remain quite small through the winter, and feed up in the spring; the perfect insects appear in June and July.

The four species at present known to us as British may be thus recognised:—

A. Fore-wings with three elongate red blotches. *A. Minos.*

AA. Fore-wings with distinct red spots.

B. No red spot on the middle of the hind-margin.

C. The second pair of red spots large and generally united. *A. Trifolii.*

CC. The second pair of red spots small and never united. *A. Loniceræ.*

BB. A red spot on the middle of the hind-margin (forming a sixth spot). *A. Filipendulæ.*

All the species of this genus are liable to have the red markings replaced by yellow; and *Trifolii* is subject to vary to such an extent that sometimes all the red spots are united, forming a long irregular blotch, yet it cannot then for a moment be mistaken for *A. Minos*, of which the wings are less densely scaled, and therefore semitransparent, and the antennæ are much more blunt at the tip.

A. Minos. 1″ 1‴—1″ 3‴. Subdiaphanous. *F.-w. bluish green, with 3 irregular elongate crimson dashes;* h.-w. crimson, with a very narrow purplish hind-margin. VI m—e.

Larva pale yellow or greenish, with 2 rows of 12 black spots on each side. Head and fore-legs blackish (*Dup.*) On *Trifolium montanum*, bird's-foot trefoil (*Lotus corniculatus*), and horse-shoe vetch (*Hippocrepis comosa*). V and VI.

West of Ireland, Clare and near Ardrahan, in Galway.

A. Trifolii. 1″ 2‴—1″ 5‴. *F.-w. greenish blue, with 5 deep crimson spots*, 2 basal and confluent, 2 central and GENERALLY CONFLUENT, and 1 beyond the centre; h.-w. deep crimson, generally with a broad purplish hind-margin. Antennæ RATHER SHORT and THICK, with CONSIDERABLE THICKENING before the tip. VI—VII.

Larva green or yellowish green, with 2 dorsal rows of black spots, and a row of black spots on each side (*Boisd.*) On horse-shoe vetch (*Hippocrepis comosa*), bird's-foot trefoil (*Lotus corniculatus*) and *Trifolium procumbens*, &c. V.

Bl.! Brs. Ct.! Do. Ep.!! Ha.! K.! Lw.! Lc. Ly.! M.!! O.! St.

A. Loniceræ. 1″ 1‴—1″ 5‴. *F.-w. greenish blue, with* 5 *deep crimson spots*, 2 basal and nearly confluent; 2 central NEVER UNITED, and 1 beyond the centre: h.-w. rather deep crimson, with a narrow purplish hind-margin. Antennæ RATHER LONG and SLENDER with MODERATE THICKENING towards the tip. VII.

Larva apple-green; on each side are 2 black stripes, interrupted between the segments; on each segment is placed a yellow spot between the 2 stripes (*Boisd.*) On bird's-foot trefoil (*Lotus corniculatus*) and horse-shoe vetch (*Hippocrepis comosa*). V.

Bl.! Brs.! Bu. Do. *Ex.* Hu.!! Sc.!! Te. Wa.! Wi.!! Y.!

A. Filipendulæ (Six-spot Burnet). 1″—1″ 5‴. *F.-w. greenish blue, with* 6 *deep crimson spots*, 2 basal and confluent, 2 central, sometimes confluent, and 2 beyond the centre, sometimes confluent; h.-w. deep crimson, with a narrow purplish hind-margin. VI—VII.

Larva yellow, with 2 rows of black spots on each segment; head and fore-legs black (*Hub.*) On various leguminous plants. V and VI.

Common throughout the country, and in most places abundant.

Family II. SPHINGIDÆ.

Imago with the antennæ slightly thickened in the middle, generally terminating in a hooked bristle: wings large, clothed with scales; fore-wings elongate and pointed, or with the hind-margin indented: larva firm, naked, generally with a horn on the back of the 12th segment; retires under ground to effect its transformation.

The perfect insects fly at dusk or during the night.

Of this family we have five genera, comprising fourteen species; with the exception of the first genus, *Smerinthus*, the species of which fly slowly and heavily, the flight of the others is extremely rapid: it is difficult for the eye to follow them, and their rapid revolutions render it no easy matter for the tyro, who suddenly sees so large an insect "looming in the

distance" in the twilight of a summer's evening, to succeed in capturing "the great unknown."

With this family the collector enters upon a new phase of his studies, for these insects are far more frequently met with in the larva state than as perfect insects; indeed almost all the specimens we find in collections are bred. It is true that some species come to light, and others may be taken at flowers, as was the case in 1846 with *Sphinx Convolvuli*, which was captured on the wing by hundreds.

Now it will not be a very difficult matter to tabulate the larvæ of the SPHINGIDÆ, so that on finding a larva the collector may speedily discover what it is:—

A. Larvæ with the anterior segments attenuated and retractile.
  B. With eye-like spots on the 5th and 6th segments.
    C. With no horn. *C. Porcellus.*
    CC. With a short horn. *C. Elpenor.*
    CCC. With a very slender, quite straight horn, of average length. *C. Celerio.*
  BB. With eye-like spots on the 4th segment. *C. Nerii.*
AA. Larvæ with the anterior segments not especially attenuated, and not retractile.
    D. Head pointed above; sides dotted with white or yellow.
      E. A scutcheon on the anal segment behind the horn. *S. Tiliæ.*
      EE. No scutcheon on the anal segment behind the horn.
        F. Horn sky-blue. *S. ocellatus.*
        FF. Horn yellowish above, reddish beneath. *S. Populi.*
    DD. Head rounded above; sides not dotted.
      G. Horn turned backwards, and then recurved upwards. *A. Atropos.*

GG. Horn with a simple curve backwards.
H. Horn smooth.
I. Spiracles black. *S. Convolvuli.*
II. Spiracles orange. *S. Ligustri.*
HH. Horn rough and black. *S. Pinastri.*
HHH. Horn rough and red.
K. Dorsal line pale grey. *D. Galii.*
KK. Dorsal line red. *D. Euphorbiæ.*
KKK. Dorsal line black. *D. Livornica.*

By this table it is hoped that a collector, falling in with any full-fed larva of this family, may be able to suspect to which species it belongs, and if he then refers to the description of the larva of that species, and finds that it agrees with the caterpillar he has in hand, the presumption will be strong that his suspicion is well founded.

The rare Sphinges seem in this country to have no settled time of appearance in the perfect state; they are met with sometimes at the end of autumn, sometimes in early spring, but their natural periods of flight are known on the Continent, and it is those that we cite here.

The earliest to appear are the three species of *Smerinthus ocellatus*, *Populi* and *Tiliæ*, and *Chærocampa porcellus*, all of which may be expected by the end of May, provided we have seasonable May weather. *Populi* and *ocellatus* are frequently observed on palings or trunks of trees, and *Populi* not unfrequently comes to light; *porcellus* may be met with buzzing over flowers (in its especial localities) at dusk. These species all continue to be found during the following month, and at the same time *Sphinx Ligustri* appears frequenting gardens, and also *Chærocampa Elpenor*. The rare *Sphinx Pinastri* appears in June, and the blossoms of the honeysuckle in the

neighbourhood of extensive fir-woods should be carefully watched at dusk by those desirous of adding this rarity to their collections. Those who have opportunities of visiting sand-hills on the coast, where the sea-spurge (*Euphorbia Paralias*) grows, should now be on the look out for *Deilephila Euphorbiæ*.

In July stragglers of *Smerinthus ocellatus* and *Populi* still occur, and *Sphinx Ligustri* and *Pinastri* are also on the wing; and in this month *Deilephila Galii* emerges from the pupa, and may sometimes be found in gardens flying over tubular flowers at early dawn, and if the desire to obtain so great a prize induces collectors to

"Shake off dull sloth, and *early* rise,"

it is but one of the numerous instances of the indirect benefits derived from the study of Entomology.

Let any one bold enough to doubt make the experiment of visiting his garden before sunrise in July: the day before has been excessively hot, but now, how different! a delightful freshness breathes around; the grass is wet with dew; the Petunias and Verbenas, also bathed with dew, exhale a perfume grateful to the sense not only of *Galii*, but of man; the eastern sky is tinged of a golden red, and, but for the warbling of the lark, all is so calm and quiet that we cannot but feel grateful to the *Deilephila* that has enticed us to so much enjoyment.

There is an intensity of enjoyment in an early morning walk, which no lie-a-bed can understand.

In the month of August *Deilephila Galii* may still be found, and *D. Livornica* also now appears, but I am unable

to recommend any special plan for finding it: *Sphinx Convolvuli* should be looked for, but it does not appear every year: when it was so abundant in 1846, it was observed that the flowers of the Petunia were its "peculiar vanity." The Death's Head (*Acherontia Atropos*) also appears towards the end of August: it is very rarely observed on the wing.

In September *Sphinx Convolvuli* and *Deilephila Livornica* still continue out, and *Atropos* remains even till October. In the last-named month two of our great rarities appear, viz. *Chærocampa Celerio* and *Nerii:* the latter species has its home on the banks of the streams in Italy, but occasionally ranges much farther to the North, and has on more than one occasion been taken in the South of England. *Celerio*, though still a rarity, is more frequently found here, and it appears to have an extreme partiality for *light*, far more so than other of our rare *Sphinges;* perhaps this hint may be of use as contributing to its more general capture.

With reference to the times of appearance of the larvæ of the SPHINGIDÆ, one (*Livornica*) appears in July, one (*Atropos*) is findable in October; but the special months for these larvæ are July, August and September.

In July we have *Acherontia Atropos, Sphinx Convolvuli* and *Pinastri, Deilephila Livornica, Chærocampa porcellus* and *Elpenor.*

In August the three *Smerinthi, Atropos, Sphinx Ligustri, Deilephila Euphorbiæ* and *Galii, Chærocampa porcellus* and *Elpenor.*

In September *Smerinthus Populi* and *Tiliæ, Acherontia Atropos, Deilephila Euphorbiæ* and *Galii, Chærocampa Celerio, Elpenor* and *Nerii.*

Young collectors must not expect to complete their series of this family the first year; they may reasonably expect to get *Smerinthus ocellatus* and *Populi*, *Sphinx Ligustri* and *Chærocampa Elpenor*, either in the imago or larva states: and it is possible some may be so fortunate as to get *S. Tiliæ* and *C. porcellus;* but the remainder will probably long remain as "things hoped for," and years may elapse before they have the pleasure of placing in their collections such insects as *Pinastri*, *Euphorbiæ*, *Celerio*, *Livornica* and *Nerii*.

The five genera into which this family is divided may be thus recognised:—

A. Antennæ not terminating in a minute bristle; hind-margin of the fore-wings angulated. Genus 1. SMERINTHUS.
AA. Antennæ terminating in a minute bristle; hind-margin of the fore-wings not angulated.
B. Abdomen *very* thick. Genus 2. ACHERONTIA.
BB. Abdomen stout, but not *very* thick.
C. Hind-wings rounded at the anal angle, or with hardly perceptible projection. Genus 3. SPHINX.
CC. Hind-wings with perceptible projection at anal angle. Genera 4 and 5. DEILEPHILA and CHÆROCAMPA.

The essential difference between these two last is in the structure of the caterpillar, which, in CHÆROCAMPA, has the power of retracting the 3 anterior segments, a peculiarity which has obtained for them the name of *Elephants* in England and *Cochons* in France: the larvæ of DEILEPHILA have not this peculiar feature, a retractile snout.

Genus 1. SMERINTHUS.

Antennæ rather slender, gradually thickened, the tip pointed, but not terminating in a bristle. Fore-wings with the hind-margin angulated or indented. Abdomen moderately thick.

Larva rough, green, with oblique lateral stripes; the head

triangular, a conical horn on the 12th segment; enters the earth to undergo its transformations.

The larvæ feed on the leaves of sallow, willow, poplar, elm, ash, &c., in autumn.

The three species may be thus distinguished:—

A. Hing-wing with a conspicuous bluish eye-like spot at the anal angle. *S. ocellatus.*

AA. Hind-wing with a large brick-red blotch towards the base. *S. Populi.*

AAA. Hind-wings with neither of the above-mentioned markings. *S. Tiliæ.*

S. OCELLATUS (Eyed Hawk). 2″ 8‴—3″ 3‴. *F.-w. pale rosy brown,* clouded with olive markings; *h.-w. rosy,* shading into brown at the hind-margin; *near the anal angle is a large round bluish eye-like spot.* V—VII.

Larva, skin rough, apple-green, dotted with white, with 7 oblique, white, lateral stripes, bordered above with dark green; spiracles pinkish white, edged with violet. Horn rough, SKY-BLUE; the tip greenish or blackish (*Dup.*) On willow, poplar, apple, &c. VIII.

Bi.! Bl. Brg. Brs.! Bu.! Ca.! *Da.* Ep.! Ex.! Ha.! Hu. L.D. Lw.! Lc.! Ly.! M.!! Pl. Pr.! Sc.!! Sh. St.! Te. Tn.!! Wa. Wi.! Wt.! Y.!

S. POPULI (Poplar Hawk). 2″ 9‴—3″ 2‴. *Ashy grey,* clouded with pale brown; *basal part of h.-w. brick-red.* V—VII.

Larva, skin rough, apple-green dotted with yellow, with 7 oblique, yellow, lateral lines; spiracles white, edged with reddish. Horn rough, YELLOWISH above, REDDISH beneath (*Dup.*) On poplar and aspen; sometimes on sallow and birch. VIII and IX.

Bi.! Bl. Brg.! Brs.! Bu.!! Ca.! Ct. Da.! Ed.! Ep.! Ex.! G.!! Ha.!! Hu.!! K. L.D.! Lw.! Lc.!! M.!! *O.* Pl.!! Pr.! R. Sc.!! Sh.! St.! Te. Tn.! Tr.! Wa.! Wi.! Wt.! Y.!

S. TILIÆ (Lime Hawk). 2″ 7‴—3″. *F.-w. pale reddish brown, shading into* a very broad, *sandy green, hind margin:*

an interrupted, broad, central olive band, and a whitish mark near the apex; h.-w. sandy brown, with an indistinct blackish band running from the outer angle to the anal angle; basal part blackish. V—VI.

Larva apple-green, dotted with yellow; with 7 oblique, yellow, lateral lines, sometimes edged with red; spiracles orange. Horn rough, blue above, yellow beneath: BEHIND IT IS A VIOLET ESCUTCHEON BORDERED WITH ORANGE (*Dup.*) On elm and lime. VIII m—IX e.

Bl. Brs.! Ca.! Ct.! Do. Ep.! Ex.! Ha.! K. St.! Te. Wa. Wt.

Genus 2. ACHERONTIA.

Antennæ short, thick, terminating in a slender bristle; wings entire; head large; abdomen very thick.

Larva smooth, head rounded; anal horn rough, recurved at the tip; goes under ground to effect its transformations.

We have but one species of this genus; the perfect insect possesses the power of squeaking, the only Lepidopterous insect gifted with a voice; on this account, its large size, and delineation of a skull on the thorax, it is an object of terror with many of the unlearned.

A. ATROPOS (Death's Head). 4″ 1‴—5″. *F.-w. blackish brown, with* indistinct *tawny markings;* a conspicuous yellowish dot near the centre; *h.-w. yellow, with a* narrow *black central, and a* broad *black marginal, band.* VIII—X.

Larva usually lemon-yellow; towards the head and lower

part of the sides green; with 7 oblique, lateral, violet stripes; spiracles black, edged with white: horn yellowish, rough, inclined backwards, and then recurved (*Dup.*) Sometimes, but very rarely, an extraordinary variety of the larva occurs, in which the ground-colour is brownish olive, with the lateral stripes darker, and the anterior segments are whitish; it may, however, be immediately recognised by the peculiar form of the anal horn. On potato, jasmine, *Lycium barbarum* (known in gardens in the midland counties as the "tea-tree"), &c. VII m—X b.

This singular insect is very widely distributed, and is sometimes common in the larva state. *B.! Bl.!* Brg.! Brs.! Bu. *Ca.!* Da. Do. *Ed.* Ep. *Ex.!* G. *Ha.* Hu. K. *L.D.* Lw. *Lc.* Ly. M. Pl. *Pr. Sc. Sh.* St. Te. *Tn.* Tr. *Wi.* Wt. Y.

Genus 3. Sphinx.

Antennæ moderately long (not so stout as in Acherontia), terminating in a slender bristle. Wings entire; fore-wings lanceolate; hind-wings rounded at anal angle, or with hardly perceptible projection; head of moderate size; tongue very long; abdomen stout and conical.

Larva smooth, with oblique lateral lines; head rounded; anal horn pointing behind; goes under ground to effect its transformations.

The only three European species all occur here: they may be thus distinguished:—

A. Hind-wings with dark bands.
  B. Ground-colour of hind-wings pale grey. *S. Convolvuli.*
  BB. Ground-colour of hind-wings rosy. *S. Ligustri.*
AA. Hind-wings with no dark bands. *S. Pinastri.*

S. Convolvuli (Convolvulus Hawk). 3″ 9‴—4″ 9‴. *F.-w. dark grey*, with blackish streaks and with paler and darker wavy markings; *h.-w. pale grey* at the base, shading into smoky brown, *with* 1 *basal*, 2 *somewhat confluent, central, and* 1 *marginal, blackish bands.* VIII e—IX.

Larva green or brown, with 7 oblique lateral streaks:

spiracles black in white rings: horn smooth and curved (*Dup.*) On the small bindweed (*Convolvulus arvensis*, &c. VII.

Bl. Brg.! Brs. Bu. Ca. Ct. Da. Do. *Ed. Ep. Ex. G. Ha. Hu.* K. *L.D. Lw. Lc.* Ly. *M. Pl. Pr. St. Te. Tr. Wi. Wt. Y.*

Mr. Atkinson informs me that, in July, 1838, he found five or six larvæ of this insect feeding on a bed of the wild balsam (*Impatiens noli-me-tangere*), a few miles from Dolgellan, in Merionethshire, on the road to Bala.

In 1846 the perfect insect abounded throughout England to an incredible degree (in the 'Zoologist' for that year, pp. 1509—1513, the *captures of several hundred specimens are recorded*), but the larvæ had not been observed that summer, and many imagined the insects must have come from abroad, but the extreme fineness of many of the specimens, and their simultaneous appearance from Kent to the Land's End, and from Hampshire to Yorkshire, forbids the acceptance of this explanation.

S. Ligustri (Privet Hawk). 3″ 7‴—4″ 4‴. *F.-w. very pale brown;* streaked with black and *clouded with brown from the inner margin to the apex; h.-w. pale rosy, with* 3 *broad black bands.* VI—VII.

Larva bright green, with 7 oblique lateral white streaks bordered above with lilac; spiracles yellow. Horn smooth and curved; black, under side of lower half yellow. On privet (*Ligustrum vulgare*) and lilac. VIII.

Bl.! Brg.!! Brs.! Bu. Ca.!! Ct.! Do.!! Ep.!! Ex.!! *G.* Ha.! K. Lw.! Ly.! Pl.!! R.! Sc. St.! Te. Tn.! Tr.! Wa. Wi.! Wt.! Doncaster.

S. Pinastri. 2″ 10‴. *F.-w. bluish-grey*, varied *with* brown and *black dashes; h.w. brown*, without bands. VI m—VII m.

Larva green, with a red-brown dorsal stripe, and 3 lateral stripes, rather interrupted, of a citron-yellow: spiracles orange edged with black. Horn black and rough (*Dup.*) On various species of fir trees. VII—VIII.

By many doubted as a British species: but Stephens cites Colney Hatch Wood, Esher, and Rivelston Wood, near Edinburgh: I know of no recent captures.

Ratzeburg's receipt for finding the perfect insect is as follows:—"One first sees them at the flowers of the honeysuckle: and where this plant occurs over arbours in villages near the forests, one can with certainty expect them at evening dusk, if they are abundant."

Genus 4. Deilephila.

Antennæ not long, terminating in a bristle; wings entire; fore-wings lanceolate; hind-wings with a slight production at the anal angle: head rather small: tongue rather large (much shorter than in Sphinx; abdomen conical, elongate.

Larva smooth, with anal horn, the sides marked with conspicuous pale spots; anterior segments not retractile; change to pupa at the surface of the ground among leaves.

The larvæ feed on spurge, bed-straw, vine and fuchsias.

We have three British species, all of which are rare: they may be thus distinguished:—

A. Veins of fore-wings not whitish.
  B. Central portion of fore-wings rosy grey. *D. Euphorbiæ.*
  BB. Central portion of fore-wings whitish. *D. Galii.*
AA. Veins of fore-wings whitish. *D. Livornica.*

Deilephila Hippophaes is a *probable* British species, which should be looked for on the South Coast, where its food-plant, the sallow-thorn or sea-buckthorn (*Hippophaes Rhamnoides*) grows; *the green larva, with pink horn,* is said to feed in June and July, and again in September and October.

D. Euphorbiæ. 2″ 4‴—2″ 7‴. *F.-w.* rosy grey, *with an olive basal patch, a large olive central spot* near the costa, *and an olive streak* running *from the apex to the inner margin*, where it extends from the middle to the anal angle; h.-w. rosy; black at the base; a narrow blackish marginal band: anal angle whitish. VI.

Larva black, with numerous yellow dots, and with 2 rows of yellow spots on each side, the upper one much larger than the lower one; a red dorsal line, and one on each side above the legs; head and legs red; horn rough and red, the tip black (*Dup.*) On *Euphorbia Paralias* and *E. Cyparissias* (sea-spurge). VIII m—IX m.

Scarborough; formerly taken by Mr. Raddon at Braunton Burrows, near Bideford.

The following notice of the habits of the larvæ of this species, by Mr. Melhuish, who had unusual opportunities of observing it last autumn, on the coast of Brittany, near St. Pol de Léon (the larvæ, indeed, were so abundant there that he collected 400 in three days, the first week in September), will be read with interest by many:—

"*All* the larvæ that I saw at liberty were seen by me between the hours of 3 and 6 p.m. They were *invariably* actively engaged, either in feeding or in running over the sand, which they did with great ease, from a plant which they had stripped, in search of a fresh one. The eggs must be always laid at the *top* of the plant, among the soft budding leaves, for this is, *without exception*, the position of the youngest larvæ: they then gradually work their way down the plant till they reach the ground, when they run off in search of fresh food, leaving behind them a broad trail in the sand, in which each foot's tread may be distinctly traced. I believe that most plant-feeding larvæ attach themselves to

some peculiar part of their own plant in preference to other parts, but the larva of *D. Euphorbiæ* clears literally everything away before it leaves its post: leaves, stalks, flowers, seeds—all are eaten, except the central stem, and even this in young plants, which are bitten off level with the ground and disappear altogether. You can always tell, from a great distance, whether any larvæ will be found on a given bed, from the appearance of the plants: if the stems are stripped, they are gone, but sure to be found not far off; if the leaves are withered, it is of no use looking for them,—you will only find a few dead bodies,—they are all under ground; where there is a green-looking bed of the *Euphorbia* you are sure of getting a score or two. Though they will eat everything but the stringy roots, yet they certainly *prefer* the seed-vessels or young stalks, as these contain most of that milky juice which is their great delight. If you break a twig and offer it to them, they will disregard the leaves to fasten on the broken end, and lick up the milk as it oozes out. The seed-vessels they take between their front legs, and, raising themselves into the 'Sphinx' posture, gnaw away at one till it is demolished, just like a monkey with an apple, their feet close before their mouths. If interrupted at any time while feeding, they turn round with the greatest fury and spit out a quantity of green liquid, of an acid and disagreeable smell, similar to that of the spurge-milk, only worse. When a larva, after rambling about, finds a fresh plant to his taste, he sets to at once upon the bottom leaves, merely raising up his head from the ground, and devours all within his reach, before proceeding to climb the stem: these bottom leaves are, of course, very inferior, but were the large larvæ who are old

enough to travel to go and mount up to the top at once, and eat all the tender shoots, of course all the tiny individuals just out of their eggs would be starved. A larva never turns —it goes up or down, according to circumstances, but only one way. They must swallow large quantities of sand, for however sandy a leaf may be, if it is fresh, they never reject it on that account. I should add that 'frass' and 'trails' are proof positive of the recent visit of larvæ, when not themselves visible, as both are soon covered by the sand."

D. Galii. 2″ 6‴—3″. *F.-w. dark olive-green*, with a broad paler hind-margin, and *an irregular* WHITISH *streak*, extending *from near the base of the inner margin to the apex;* the dark margin of its outer edge begins considerably BEFORE THE MIDDLE; h.-w. rosy, black at the base, with a narrow black marginal band, and a whitish anal angle. VII m—VIII m.

Larva dull greenish grey, with a conspicuous pale yellow spot in a broad black ring on the upper part of the side of each segment; spiracles yellow; horn bright red. On bedstraw (*Galium verum*), and in gardens on fuchsias. VIII m —IX m.

Brg. Brs. Ep. Ex. Hu. L.D. Lw. M. Pl. Y. Felixtowe.

D. Livornica. 3″ 4‴. *F.-w. dark olive-green*, with paler hind-margin, and *a pale ochreous streak from the base of the inner margin to the apex;* VEINS DISTINCTLY WHITISH; h.-w. rosy, black at the base, a narrow black marginal band, and a whitish anal angle. VIII—IX.

Larva greyish ochreous, with a broad black dorsal line, and a black line below the spiracles; on each side of the black dorsal line are ten round pale ochreous spots, each (excepting the last) nearly filled up by a round black spot; horn red, with a black tip, curved and rough (*Fuessly*). On *Galium* (bedstraw) and vine. VI—VII.

Brg. G. Lc. L.D. Lw. M. Pl. Pr. Barnsley.

Genus 5. Chærocampa.

Imago as in Deilephila.

Larva smooth, with the anterior segments retractile, and with conspicuous ocellated spots on the sides of the 4th. or 5th and 6th segments, generally with anal horn, but in *Elpenor* the horn is short, and in *Porcellus* it is altogether wanting.

The larvæ feed on the oleander, vine, fuchsia, willow-herb (*Epilobium*) and bedstraw (*Galium*).

We have four British species, which may be thus recognised:—

A. Expansion of the wings above 4 inches; fore-wings with large green blotches. *C. Nerii.*

AA. Expansion of the wings under 3½ inches; fore-wings with no green blotches.

B. Fore-wings with a central black dot in a white ring. *C. Celerio.*

BB. Fore-wings with no central black dot nor white ring.

C. Ground-colour of hind-wings rosy. *C. Elpenor.*

CC. Ground-colour of hind-wings dull yellow. *C. Porcellus.*

C. Nerii 4″ 2‴—4″ 4‴. *F.-w.* pale rosy grey, *with large irregular blotches of dull green*, more or less intersected with wavy whitish streaks; h.-w. purplish brown at the base, shading into dull green at the margin, with a single curved whitish line a little beyond the middle. X.

Larva green (or yellow), with 2 large ocellated spots on the 4th segment, and a longitudinal white streak on each side, and numerous small white dots on the 6th to 12th segments; horn short, blunt, curved downwards, orange-yellow (*Dup.*) On oleander (*Nerium oleander*), and has been found on periwinkle. IX.

Has occurred at Dover, Teignmouth and Brighton, always singly; the capture of the last specimen is thus recorded in the 'Zoologist' for 1852, p. 3624:—"On the 11th of September a specimen of *Chærocampa Nerii* was taken in Mont-

pelier Road, Brighton, by a young gentleman at school, while it was hovering about a passion-flower."

C. Celerio. 3″—3″ 2‴. *F.-w. pale brown, marbled with darker;* a waved dull ochreous band from the inner margin before the middle to the apex, with a distinct pale margin on its inner side; *a black dot in a white ring near the centre of the wing. H.-w. bright rosy at the base,* paler towards the margin, with *a narrow marginal and broad central black band* connected by six black streaks. X.

Larva green or purplish brown. On the 5th and 6th segments are 2 round black spots, dotted with yellow and encircled with a yellow ring; those on the 5th segment larger. Horn brown, very slender and quite straight (*Freyer*). On vine. IX.

Brs. Da. Hu. L.D. Lw. Lc. M. Pr. St. Tn. Wt. Doncaster and Wakefield.

The following localities of capture indicate its partiality for light:—"Two on window-sills, and one brought me from a chemist's shop, into which the light had lured it." "Two found by a mason whilst pulling old window-frames out, a third at rest on a window-shutter."

"*Crimine ab uno disce omnes.*"

C. Elpenor (Elephant Hawk). 2″ 5‴—2″ 6‴. *F.-w. dull yellowish green,* with hind-margin, costa and 2 oblique bands rosy; *h.-w. rosy, basal half blackish.* VI.

Larva sometimes green, but generally dark grey, marbled with black; 5th and 6th segments each with a large black spot on each side, the upper portion of which contains a white kidney-shaped spot nearly filled up with brown-grey; horn short and black, tip white. Feeds on willow-herb (*Epilobium*), vine and *Fuchsia.* VII e—IX b.

Bi.!! *Bl.* Brg. Brs.! Bu.! Ca.! Ct.! Ep.! Ex. Ha.! Hu. K. L.D. Lw. Lc. Ly.! M.! Pl.! Pr.! Sc.!! *Sh.* St.! Te. Tn. Tr. Wa. Y.

C. Porcellus (Small Elephant). 1″ 9‴—2″ 1‴. *Dull yellow, with broad rosy hind-margins.* F.-w., costa rosy, this colour extending into the wings at the centre and towards the apex; *h.-w., costal part and inner margin blackish.* V e—VI.

Larva light brown mottled with dark brown or black, sometimes light green mottled with dark green or black; 5th and 6th segments each with an eye-like spot on each side, and a few black spots indicating a similar spot on the 4th segment. No horn. Feeds on bedstraw (*Galium verum*). VII—VIII.

Bi.!! *Bl.* Brg.!! Brs. *Ca.!* Ed.! Ep. Ha.! L.D. Lw.! M. Pl. Pr.! St. Tn. Wa. Y.

Family III. SESIIDÆ.

Imago with the antennæ much thickened beyond the middle, terminating in a hooked bristle. Wings short and comparatively broad. Abdomen thick, with a broad tuft at the tip. Larva smooth, elongate, with a horn on the back of the 12th segment. Pupa on the ground, amongst leaves.

The perfect insects fly by day, in the hottest sunshine.

Of this family we have two genera, comprising only three species, all remarkable for that rapidity of flight which has procured for one of them the name of "The Humming-Bird Hawk Moth."

It is in the "merry month of May," when the collector is busy among the small Fritillaries (*Selene* and *Euphrosyne*)

that the two clear-winged species of this family occur: they are generally noticed buzzing at flowers in the open parts of woods. *Macroglossa Stellatarum* is more of a garden insect, and may be noticed stealing the sweets from our honeysuckles and other tubular flowers from May till late in September.

Young collectors may reasonably hope to *see* it during their first season; but it is not very easily caught on the wing; that is to say, you must learn how to catch it, by striking at several specimens and—missing them.

The two genera of this family may be at once distinguished thus:—

A. Wings densely clothed with scales, not transparent. Genus 1. Macroglossa.

AA. Wings transparent, only the margins clothed with scales. Genus 2. Sesia.

Genus 1 Macroglossa.

Wings densely clothed with scales; head, thorax and body with closely appressed flat scales.

We have but one species.

M. Stellatarum (Humming-Bird Moth). 1″ 11‴—2″. *Smoky brown, with* a central black dot, a waved black line on each side of it, and *indistinct black clouds* towards the base. *H.-w. dull tawny,* the base blackish brown, the hind-margin reddish brown. V—IX.

Larva, skin rough, green, with white dots; a pure white subdorsal line and a yellowish white line above the legs; fore-legs red; horn short, rough, nearly straight, dull blue, with the tip yellowish (*Dup.*) Feeds on bedstraw (*Galium Mollugo*). VIII and IX.

Brg.!! Brs. Bu.! Ca.!! Ct. Da. Do.! Ed. Ep.! Ex. Ha. Hu. K. L.D.! Lw.! Ly.! M. Pl.!! *Pr.* R. Sc. *Sh.* St. Te. Tn.! Tr.! Wa. Wt. Y.

Genus 2. Sesia.

Wings with the entire disk transparent (only loosely clothed with scales on the insect first emerging from the chrysalis); head, thorax and body clothed with loose downy scales, very similar to the pubescence of a humble-bee.

Larva feeding on honeysuckle and scabious.

The two species may be thus recognized :—

A. Hind-wing with *rather broad* red-brown hind-margin. *S. fuciformis.*

AA. Hind-wing with *very narrow* brown hind-margin. *S. bombyliformis.*

These insects have a remote resemblance to humble-bees.

S. FUCIFORMIS (Broad-bordered Bee Hawk). 1″ 9‴ — 1″ 10‴. *F.-w., base and costa black, tinged with* GREEN; central spot and BROAD *hind-margin* RED-*brown;* h.-w., base black tinged with green; hind-margin RATHER BROAD and red-brown. V.

Larva pale green, yellowish dorsal and lateral lines, violet above the feet; spiracles brownish red; horn curved, brownish red or orange (*Ochs.*) Feeds on honeysuckle. VII.

Bl. Ep.! Ex. *Ha. Lw.* Ly.! O.! St. *Wi.*

S. BOMBYLIFORMIS (Narrow-bordered Bee Hawk). 1″ 6‴ — 1″ 9‴. *F.-w., costa and a broad patch on the inner margin black tinged with green; hind-margin brown,* broad towards the apex, NARROW *at the anal angle;* h.-w., base tinged with yellow, with a VERY NARROW brown hind-margin. V.

Larva green dotted with yellowish white; two rows of dull reddish spots on each side of the 5th to 12th segments; the white spiracles are placed in the lower row of reddish spots; horn slightly rough, short, pointed, reddish; legs reddish, except the anal pair, which are green (*Dup.*) Feeds on field scabious (*Scabiosa arvensis*). VII c—VIII b.

Bl. Brg.! Ca.! *Ep.* Ex. Ha. Hu. K.! L.D. Lw. M. O. St. Wi.! Y. Carlisle.

Family IV. ÆGERIIDÆ.

Antennæ slightly thickened beyond the middle; wings narrow, elongate, transparent, only the margins and a central blotch with scales; abdomen rather long.

Larva smooth, whitish (with no horn), feeding within the stems or roots of trees and shrubs, and changing therein to a pupa, which has spines on the hinder segments.

The perfect insects fly slowly, or occasionally hover among bushes and flowers.

Of this family we have two genera, comprising thirteen species, several of which are still great rarities with us.

Towards the middle or end of May specimens of *Sphecia apiformis* may be observed sunning themselves on the trunks of poplars. At the same period *Trochilium culiciforme* may be met with flying swiftly in woods; and *T. sphegiforme* is also at large, but, being so great a rarity, I cannot give directions where it may be found. In June the three named still continue out; and then also appear those three rarities, *T. vespiforme*, *chrysidiforme* and *scoliæforme*, which have occurred at Epping, Folkstone and Llangollen respectively; and the four commoner species — *T. cynipiforme*, so partial to the Hyde-Park oaks; *T. tipuliforme*, which frequents the currant-bushes of our gardens, by no means assisting their vigorous development; *T. myopæforme*, which is found in orchards, among

apple and pear trees; and *T. formicæforme*, which is to be sought for in osier-beds. July arrives, and the stragglers of *S. apiformis* are still left for those laggard entomologists who are just in time to be *not* too late for a species; *S. bembeciformis* is to be found amongst sallows. *T. scoliæforme*, *myopæforme* and *formicæforme* still remain out, and *T. ichneumoniforme* appears, and is best obtained by sweeping the herbage in those places where it is known to occur; it continues during the following month, when it and *T. formicæforme* are the sole representatives of the numerous little colony of Clear-wings.

Those who wish to open the campaign before May would do well to look after the larvæ of the various species in April, as in April and May all the known larvæ are to be met with in the pith or beneath the bark of the various bushes and trees on which they feed.

The young collector may expect to meet with *T. tipuliforme* his first season; perhaps, also, *T. myopæforme* or one of the other commoner species: the rarities must be waited for. But a word of caution when you see a *Trochilium* seated on a leaf: don't try to catch it with a pill-box, however quiet it may look; don't, or you will miss it; for, just as you approach it, it will give a jump or a jerk, and you will find you have the pill-box in your hand, but the *Sphinx* you were going to catch is gone, somehow; so you will have to scratch your head, and look so stupid.

The two genera may be readily distinguished thus:—

A. Abdomen moderately stout; no anal tuft. Genus 1. Sphecia.

AA. Abdomen slender, with an anal tuft. Genus 2. Trochilium.

Genus 1. Sphecia.

Antennæ (pectinated in the males) terminating in a slender tuft of hair; wings with the entire disk transparent (only loosely clothed with scales on the insect first emerging from the chrysalis); abdomen rather stout, pointed, not with an expansive anal tuft.

Larvæ feed on poplars and sallows.

The two species may be thus distinguished:—

A. Head yellow; thorax black, with a yellow patch on each side in front. *S. apiformis.*

AA. Head and thorax blackish, with a yellow collar. *S. bembeciformis.*

These insects are very sluggish in their habit, and, from their transparent wings and yellow-belted bodies, look very much like large wasps or hornets, when seen at rest.

S. APIFORMIS. 1″ 4‴—1″ 7‴. Costæ yellowish brown; hind-margins fringed with brown; *head* YELLOW; *thorax blackish above, with a yellow* PATCH *on each side* in front. V e—VII.

Larva whitish yellow, with a darker dorsal line and a large blackish brown head (*Ochs.*) Lives in stems and roots of poplars. VIII—IV.

Ca.!! *Ct.* Ep.! *Ex.* G. Ha. Sh.! Te.

S. BEMBECIFORMIS. 1″ 3‴—1″ 9‴. Costæ yellowish brown; hind-margins fringed with brown; *head* BLACKISH; *thorax blackish, with a yellow* COLLAR. VII.

Larva whitish, with brownish spiracles (*Steph.*) Feeds in the wood of the sallow. IX—V.

Bi.!! Brg.! Brs. Bu. Ca.! Ep.! Ha. Hu.! L.D. Lc. M.! Pr.! Sc.!! Te. Y.!

Genus 2. Trochilium.

Antennæ (simple, ciliated or pectinated in the males) terminating in a slender tuft of hairs; hind-wings transparent; fore-wings generally with the basal half transparent; abdomen slender, with a more or less conspicuous anal tuft.

Larvæ feed within the stems of currant, birch, oak, apple, willow, &c.

The eleven species may be thus tabulated:—

A. Fore-wings brown, not transparent. *T. vespiforme.*
AA. Fore-wings transparent, at least towards the base.
  B. Abdomen with yellow or whitish belts.
    C. Abdomen with six or seven belts; anal tuft slender. *T. ichneumoniforme.*
    CC. Abdomen with four belts; anal tuft large, black in the ♂, yellow in the ♀. *T. cynipiforme.*
    CCC. Abdomen with three or four belts; anal tuft large, black. *T. tipuliforme.*
    CCCC. Abdomen with two belts; anal tuft black at the sides, orange-red in the middle. *T. chrysidiforme.*
    CCCCC. Abdomen with two belts; anal tuft yellow. *T. allantiforme.*
    CCCCCC. Abdomen with two belts; anal tuft dark fuscous shading into saffron. *T. scoliæforme.*
    CCCCCCC. Abdomen with one belt; anal tuft black. *T. sphegiforme.*
  BB. Abdomen with red belts.
    D. Apical portion of fore-wing reddish. *T. formicæforme.*
    DD. Basal portion of fore-wing tinged with reddish. *T. culiciforme.*
    DDD. With no reddish scales on the fore-wing. *T. myopæforme.*

The above ought to enable any one to ascertain the name of

a species of Clear-wing; but, in case they should confuse between *cynipiforme* and *tipuliforme*, it may be mentioned that the former has a small yellow spot at the base of the fore-wing, which is wanting in the latter.

T. VESPIFORME. 1″ 2‴—1″ 3‴. *F.-w. dark fuscous*, rather transparent towards the base; *h.-w., transparent*, with dark fuscous cilia; abdomen black, with 3 yellow belts; antennæ of the male strongly ciliated. VI.

LARVA UNDESCRIBED. Feeds in the branches, stems and roots of poplar (*Populus nigra*), more rarely in aspen (*P. tremula*. IV.

Ep.

T. CHRYSIDIFORME. 10‴. *F.-w. with the costa and hind-margin black*, and a large black spot beyond the middle, reaching half-way across the wing; *inner margin orange-red; apical hyaline patch nearly filled up with orange-red;* h.-w. with black margin and cilia; head and thorax black; abdomen black, with 2 pale yellowish rings; *anal tuft black at the sides, orange-red* IN THE MIDDLE. VI e.

LARVA UNKNOWN.

The only recent capture was the specimen taken by Mr. Brewer last summer near Folkstone.

T. ICHNEUMONIFORME. 8‴—10‴. *F.-w., margins blackish; hind- and inner margins tinged with ochreous;* central spot black; h.-w., fringe blackish; head and thorax blackish; *abdomen black, with* 6 *yellowish rings* in the ♂, 7 in the ♀. VII—VIII.

LARVA UNKNOWN.

Brs. *Ep. Pl. Sc.* Te. Isle of Portland, and used to be taken at the Charlton sand-pit.

T. CYNIPIFORME. 7½‴—11‴. *F.-w., costa and hind-margin* BLUE-*black; inner margin* and central spot *blue-black tinged with orange;* h.-w. with black fringes; head black; thorax black, with a yellow collar and a yellow stripe on each side; *abdomen black, with* 4 *yellow rings.* VI.

Larva whitish, with a brown head (*Westw.*). Feeds in the bark of oak.

Brs. Ep. O. Pm. &c. Hyde Park.

T. SPHEGIFORME. 1″ 1‴. *F.-w., margins black; hind-margin with a purple gloss;* central spot purplish black; h.-w., fringes purplish black: *antennæ black, with a broad white ring* before the tip; head black; thorax black, with a white stripe on each side; *abdomen black, with* ONE *white ring; anal tuft* BLACK. V m—VI b.

LARVA UNDESCRIBED. Lives in stems of alder (*Alnus glutinosa*)—(*Staud.*)

Bu. M. Y.

T. SCOLIÆFORME. 1″—1″ 3‴. *F.-w., costa and hind-margin bluish black; central fascia broad, bluish black,* WITH A WEDGE-SHAPED PROJECTION TOWARDS THE BASE; h.-w., fringes bluish black; antennæ bluish black, in the ♀ straw-colour below the apex: thorax black, with 2 lateral oblique yellow lines; *abdomen bluish black, with* TWO *yellow rings; anal tuft* dark fuscous, shading into SAFFRON. VI—VII.

LARVA UNDESCRIBED. Feeds in the trunks of birch (*Betula alba*)—(*Staud.*) IV.

Taken by Mr. Ashworth at Bryn Hyfryd, near Llangollen, in North Wales.

T. ALLANTIFORME. 10‴. *F.-w., margins and central fascia blue-black; abdomen black, with 2 slender yellow belts; anal tuft* YELLOW.

LARVA UNKNOWN.

A single specimen, taken by Mr. Chant at Greenhithe, is in the rich collection of Mr. Shepherd.

T. TIPULIFORME. 9‴—10‴. *F.-w., margins* and central spot *black tinged with orange*; hind-margin distinctly streaked with orange; h.-w., margins black tinged with orange; fringes paler; head black; thorax black, with a yellowish stripe on each side; *abdomen black, with 3 yellowish rings; anal tuft black.* VI.

Larva whitish, with a darker dorsal line; head pale brown, the hinder part showing through the second segment; two linear brown spots on the second segment behind the lobes of the head. Feeds on pith of currant-bushes. X—IV.

Brg.! Brs.! Bu.!! Ct.! Da.! Ep.! Ex.! G.! Hu. K.! Lw.! Le.! M.! Pl.! Sc.! Sh. Te. Tn.! Wa.! Wi.! Y.!

T. MYOPÆFORME. 8‴—10½‴. *F.-w., margins blackish; hind-margin tinged with purplish*; central spot blackish; h.-w., fringes blackish; head and thorax black; *abdomen black, with* 1 *broad red ring.* VI—VII.

LARVA UNDESCRIBED. Feeds in the stems and branches of apple trees (*Staud.*) V.

Brs. Ep. K. Lw.!

T. CULICIFORME. 1″—1″ 1‴. *F.-w., costa, hind-margin* and central spot *blue-black;* INNER MARGIN TOWARDS THE BASE REDDISH; h.-w., fringes blackish; head and thorax blue-black; *abdomen blue-black, with a broad red ring.* V e—VI b.

Larva whitish yellow, with a brown head and a honey-yellow second segment (*Freyer*). Lives in the trunks and branches of birch (*Betula alba*), more rarely in alder (*Alnus glutinosa*)—(*Staud.*); and betrays itself by its frass (*Freyer*). IV.

Ep. *M. Y.*

T. FORMICÆFORME. 10‴—11½‴. *F.-w., margins black tinged with red, the* TIP BROADLY RED; central spot black; h.-w., fringes blackish; head and thorax black; *abdomen black, with a broad dark red ring.* VI—VIII.

Larva whitish, with brownish head, and brownish spots on the second segment (*Hub.*) Feeds in the shoots of willows, especially *Salix triandra* and *S. viminalis.* V.

Ca.! Ep. K.

BOMBYCINA.

The insects of this group are called SPINNER by the Germans, the aptness of which name is at once seen, as it is to this group that all the larvæ which produce the SILK of commerce are referable; as entomologists know all larvæ *can* spin; but the silkworm and a few other larvæ are the only *spinners* which are made use of by man.

The group is but poorly represented in Britain (or even in Europe); hence our few species are divided amongst a great number of genera; and the vast gaps which occur whenever we attempt a regular arrangement of our species show how difficult it is to comprehend the scheme of entire groups, from the examination only of the species occurring in a single country.

Twelve families are represented in Britain.

1. HEPIALIDÆ, including the Ghost Moth and other Swifts.
2. ZEUZERIDÆ, including the Goat Moth and Wood Leopard.
3. NOTODONTIDÆ, including the Puss Moth, Lobster Moth, Prominents, Buff-Tip, &c.
4. LIPARIDÆ, including the Tussocks, Vapourers, Brown-Tail, Gold-Tail, &c.
5. LITHOSIDÆ, including the *Lithosiæ* and allied genera.
6. CHELONIDÆ, including the Tiger Moths, Ermines, &c.
7. BOMBYCIDÆ, including the Eggers, Lackeys, Drinker, and Lappet Moth.
8. ENDROMIDÆ, containing only one species, the Kentish Glory.
9. SATURNIDÆ, containing only one species, the Emperor Moth.
10. PLATYPTERYGIDÆ, containing the *Drepanæ* and allied genera.

11. Psychidæ, comprising the genera *Penthophera*, *Psyche* and *Fumea*.
12. Cochliopodidæ, containing only two species, *Heterogenea Asellus* and *Limacodes Testudo*.

The following is an attempt at a tabular arrangement of these families:—

A. Antennæ very short, shorter than the thorax; a space between the hind-wings and fore-wings at the base. 1. Hepialidæ.
AA. Antennæ not shorter than the thorax; a space between the wings at the base. 2. Zeuzeridæ.
AAA. Antennæ not shorter than the thorax; no space between the wings at the base.
B. Each wing with an ocellated spot. 9. Saturnidæ.
BB. Wings with no ocellated spot.
C. Collar well developed.
D. Wings variegated; hind-wings rather duller than fore-wings, but with similar spots and markings. 8. Endromidæ.
DD. Wings variegated; hind-wings brightly coloured and spotted; abdomen coloured; antennæ of the male pectinated. 6. Chelonidæ.
DDD. Wings not variegated; fore-wings at most with a pale costa and few dark spots; hind-wings unspotted; abdomen coloured only at the tip; antennæ of the male simple, filiform. 5. Lithosidæ.
CC. Collar slightly developed.
E. Antennæ of the male simple. 12. Cochliopodidæ.
EE. Antennæ of the male pectinated.
F. Wings of the males unicolorous grey or black, or reticulated; females wingless. 11. Psychidæ.
FF. Wings not unicolorous grey or black, nor reticulated; females with wings fully developed (or, as in *Orgyia*, with very short wings).

G. Abdomen slender in both sexes. 10. PLATYPTERYGIDÆ.

GG. Abdomen rarely slender in the male, never in the female.

H. Fore-wings with a projecting tooth of scales on the inner margin. (Many of the) 3. NOTODONTIDÆ.

HH. Fore-wings with no projecting tooth of scales on the inner margin. 7. BOMBYCIDÆ; 4. LIPARIDÆ; and (some of the) 3. NOTODONTIDÆ.

Family I. HEPIALIDÆ.

Imago with the antennæ extremely short, shorter than the thorax; wings distant at the base, elongate and somewhat lanceolate. Larva elongate, naked, with horny plate on second segment; feeding on the roots of plants. Pupa with short spines on the segments.

About the middle of May, nearly simultaneous with the blossoming of the purple clover, *Hepialus lupulinus* appears in meadows at evening dusk: it flies here and there below the tops of the grass with extreme rapidity. The beginning of June *H. Humuli* also frequents meadows, and *H. hectus* is found near woods. The males of both these species fly in a peculiar oscillating way, as though attached to the extremity of a pendulum. The same month *H. Velleda*, which flies as "daftly" as *H. lupulinus*, appears in its respective localities; and at the end of July and in August *H. sylvinus* is on the wing. The beginner may safely expect to meet with *H. lupulinus* and *Humuli* his first season, and, as none of the species are rare, he may get all in a few years.

This family comprises but one genus, which it is therefore unnecessary to characterize.

Genus 1. Hepialus.

We have five British species, which may be readily distinguished as follows:—

A. Fore-wings with two oblique pale bands.
  B. The pale bands parallel. *H. hectus*, ♂.
  BB. The pale bands meeting on the inner margin, nearly at a right angle.
    C. The first pale band starts from the base of the wing.
      D. Fore-wings not dappled with darker spots; fringe not chequered. *H. lupulinus.*
      DD. Fore-wings dappled with darker spots; fringe chequered. *H. Velleda.*
    CC. The first pale band starts at some distance from the base of the wing; both bands are more slender and straighter than in the two preceding species. *H. sylvinus.*
AA. Fore-wings with no pale bands.
    E. All the wings white. *H. Humuli*, ♂.
    EE. Fore-wings dull yellow streaked with brick-red. *H. Humuli*, ♀.

In *H. hectus* ♀ the pale bands are wanting, but are replaced by indistinct parallel darker markings.

Varieties of *H. lupulinus* occur with the pale bands more or less obliterated, and in *H. Velleda* there is a variety (formerly called *Carnus*) in which they are entirely wanting; but the species may be recognized by the chequered fringe of the fore-wings.

1. H. hectus (Golden Swift). 1″ 1‴—1″ 2‴. Fringes spotted; ♂, f.-w. dull orange, with 3 oblique rows of more or less connected whitish spots; ♀, f.-w. pale brown, with indistinct oblique darker markings. VI.

Larva greyish, shining; head yellowish; 2nd, 3rd and 4th segments dark grey (*Freyer*). IV. At the roots of moss. Feeds on the leaves of the dandelion.

Moist places near woods, generally distributed and common.

H. LUPULINUS (Common Swift). 1″—1″ 6‴. Fringes unspotted; f.-w. pale brown, with a whitish streak from the base towards the inner margin, and an interrupted whitish streak from near the inner margin to the apex. Very variable. ♀, markings more indistinct. V e—VI m.

Larva whitish; head and fore-legs shining, brownish yellow; 2nd, 3rd and 4th segments with a yellowish brown plate above. IX—IV. On the roots of herbaceous plants.

Abundant everywhere.

H. HUMULI (Ghost). 2″—2″ 7‴. ♂, snowy white, with brownish costæ and fringes; ♀, f.-w. deep dull yellow, with irregular central spots and an interrupted marginal band, brick-red; h.-w. dull and lead-colour at the base, shading into dull orange at the costa and hind-margin. VI.

Larva whitish ochreous; head reddish brown; 2nd segment with a reddish brown plate in front; spiracles black (*Hub.*) At the roots of hop, burdock, nettle, &c. VIII—IV.

Abundant everywhere.

H. VELLEDA (Beautiful Swift). 1″ 2‴—1″ 9‴. Fringes spotted; f.-w. pale reddish brown, with whitish spots and dark brown blotches; a whitish streak from the base towards the inner margin, and another from thence to the apex.

There is a constant variety which has the f.-w. dull reddish brown, with a white spot beyond the centre. VI—VII.

LARVA UNDESCRIBED.

Feeds on the roots of the common fern (*Pteris aquilina*). Principally a northern species; where it occurs generally very abundant. Bu.!! Ct. Da. Ed. G.! L.D.! M.! Pr. Sc.! *Wi.*

H. SYLVINUS. 1″ 3‴—1″ 10‴. Fringes orange and unspotted; f.-w. dull orange, with indistinct darker markings, and with an oblique white streak from near the base to the inner margin, and another from the inner margin to near the apex; h.-w. greyish brown, slightly orange at the hind-margin. VII—VIII.

LARVA UNKNOWN.

Not an uncommon species. Bi.! Bl. Brg.! Brs.!! Bu.! Ca.! Ct. Da.! Ed. Ep. Ha. Hu. L.D.! Lw.! Ly. M.! Pr. Sc.! St.!! Te. Tn. Wa.! Y.!

Family II. ZEUZERIDÆ.

Imago with the antennæ as long as, or longer than the thorax; wings rather distant at the base; ovipositor of the female exserted.

Larva naked, with horny plate on second segment; feeding in the wood of trees or stems of reeds. Pupa with spiny roughnesses on the segments.

These are sluggish insects of large size, appearing in June and July. The young collector should be on the look out both for *Æsculi* and *Ligniperda* on palings or trunks of trees.

This family contains but three British species, forming as many genera.

A. Antennæ of the male pectinated at the base, the apex filiform.

B. Wings white, spotted with blue-black; abdomen stout in the female, rather slender in the male. Genus 1. Zeuzera.

BB. Wings pale brown, with faintly darker markings; abdomen slender in both sexes, elongate in the female. Genus 2. Phragmatæcia.

AA. Antennæ of the male moderately pectinated throughout their length; abdomen stout in both sexes. Genus 3. Cossus.

Genus 1. Zeuzera.

Antennæ of the male pectinated to the middle, then simple; of the female simple, towards the base woolly: fore-wings with the tip rather pointed.

Z. Æsculi (Wood Leopard). 2″—2″ 7‴. F.-w. semi-transparent, white, with numerous blue-black spots: h.-w. similar; spots less distinct. VII.

Larva yellow, with raised shining black spots; head with two black spots; 2nd segment black in front; anal segment with a black patch (*Ochs.*) In the wood of various trees, principally elm, horse-chestnut, pear and apple. X—V.?

Occurs in the Parks and several of the suburbs of London, also at Bl. Brg. Brs. *Bu. Ca.!* Ep. *Ex. Ha.* K. Lw. St. Tn. Y.

Genus 2. Phragmatæcia.

Antennæ of the male as in Zeuzera, of the female ciliated throughout their length; fore-wings narrow, with the tip round; abdomen slender, elongate, in the female of extraordinary length.

P. Arundinis. 1″ 5‴—1″ 9‴. F.-w. greyish ochreous, with faintly indicated darker dots, which are more distinct in a curved streak from the base towards the anal angle; h.-w. whitish grey. VI.

Larva yellowish; head and 2nd segment brown (*Ochs.*) In the stems of the common reed. IV.

Occurred abundantly in Whittlesea Mere and Yaxley Fen before they were drained.

Genus 3. Cossus.

Antennæ of the male pectinated at the tip, of the female dentate; wings large and broad; abdomen stout.

C. LIGNIPERDA (Goat). 2″ 10‴—3″ 9‴. F.-w. pale brown, clouded with whitish, and marked with short, irregular, wavy, transverse lines; h.-w. pale smoky, with similar but indistinct markings. VI—VII.

Larva dirty yellowish or flesh-colour, reddish black on the back; head black (*Ochs.*) In the wood of willows, poplars, oaks, &c. VIII—X.

Common in most places; less frequent in the North. The fœtid odour of the larva enables us to recognize its presence, by the smell it imparts to the ground over which it has crawled.

Family III. NOTODONTIDÆ.

Imago with the antennæ longer than the thorax, pectinated in the male; abdomen thick, not gaily coloured, the thorax sometimes with bright markings (*Curtula*, *Bucephala*); fore-wings frequently with a projecting tuft of scales on the inner margin,—this, when the wings are in repose (roof-shaped) forms a little prominence on the outline of the wing, whence the ordinary term of *Prominent* applied to several of the species.

Larva of very variable form: at one extreme we find the singular CERURA larvæ, with only fourteen legs, and two long projecting tails from the last segment; at the other extreme we have larvæ with sixteen legs and no peculiarity of form, such as *Chaonia* and *Bucephala;* most have, however, the peculiarity of holding the hind segments of the body erect when in repose; generally quite naked, though downy in *Bucephala* and rather hairy in *Curtula:* very frequently there are projections on the back of the twelfth segment.

Pupa smooth, rarely enclosed in a cocoon.

Few of this family are common; many are extremely rare; May, June and July are the principal months for the perfect

insects: August and September the principal months for the larvæ. Two species, *Lophopteryx Carmelita* and *Petasia nubeculosa*, emerge from the pupa in April; on the other hand, two, *Ptilophora plumigera* and *Petasia cassinea*, do not appear till October. The commonest species are *Cerura vinula*, *Notodonta ziczac*, *Pterostoma palpina*, *Leiocampa dictæa*, *Lophopteryx camelina*, *Diloba caruleocephala*, and *Pygæra bucephala* (the two last being plentiful in the larva state). The young collector may reasonably expect to meet with these his first season. The perfect insects are found on palings and trunks of trees; they may also be attracted by light.

The following is given only as an attempt at a tabular arrangement of this group:—

A. Inner margin of fore-wings with no protuberance.
  B. Tip of fore-wing not gaily coloured.
    C. Fore-wings whitish, with bluish grey markings. Genus 1. CERURA.
    CC. Fore-wings whitish, with transverse blackish marking. Genus 6. DRYMONIA.
    CCC. Fore-wings ochreous-brown, with transverse blackish markings. Genus 7. GLUPHISIA.
    CCCC. Fore-wings ochreous-brown, with paler clouds. Genus 2. STAUROPUS.
    CCCCC. Fore-wings reddish ochreous, subdiaphanous. Genus 5. PTILOPHORA.
    CCCCCC. Fore-wings purplish grey, with conspicuous central whitish blotch. Genus 10. DILOBA.
    CCCCCCC. Fore-wings greyish, with darker longitudinal streaks. Genus 11. PETASIA.
  BB. Tip of fore-wing gaily coloured.
    D. Tip of fore-wing rich chocolate. Genus 13. CLOSTERA.

DD. Tip of fore-wing pale ochreous. Genus 14. Pygæra.

AA. Inner margin of fore-wings with a protuberance.

E. Hind-margin of fore-wings entire.

F. Fore-wings ovate, with transverse markings. Genus 3. Notodonta.

FF. Fore-wings elongate, rather transparent, with transverse markings. Genus 12. Peridea.

FFF. Fore-wings elongate, narrow, with longitudinal markings. Genus 8. Leiocampa.

EE. Hind-margins of fore-wings notched or dentate.

G. Palpi excessively prominent and hairy. Genus 4. Pterostoma.

GG. Palpi not with any unusual developments. Genus 9. Lophopteryx.

Genus 1. Cerura.

Antennæ pectinated *in both sexes*, most strongly in the male; fore-wings with no projection on the inner margin, white, with grey markings.

Larva smooth and shining; anal prolegs wanting, replaced by two projecting tails on the back of the last segment; green, with broad dark mark along the back.

Pupa enclosed in a very hard cocoon, attached to the bark of the tree on which the larva had fed.

We have four species, which may be thus recognized:—

A. Fore-wings with a distinct dark grey central band.

B. Fore-wings white. *C. bicuspis.*

BB. Fore-wings *greyish* white. *C. furcula* and *bifida.*

AA. Fore-wings with no distinct dark grey central band. *C. vinula.*

The latter species is much larger than the others, and, as it is called "the Puss," the lesser species have been termed "Kittens."

C. BICUSPIS. 1″ 8‴. F.-w. WHITE, with a broad dark grey central band; beyond the middle is a dark grey costal spot, sharply defined by the white marginal portion of the wing. V.

Larva yellowish green, the yellowish red dorsal stripe attenuated to the hump of the 4th segment, expanding to the 8th, *where it reaches the spiracle and sometimes includes it*, then diminishing to the tail (*Dup.*) Feeds, in preference, on the beech (*Dup.*), birch (*Freyer*). IX—X. Preston.

C. FURCULA. 1″ 3‴—1″ 6‴. F.-w. GREYISH WHITE, with a broad dark grey central band, its hinder margin GENERALLY SHARPLY INDENTED a little below the costa; beyond the middle, on the costa, is a dark grey spot. VI e—VIII b.

Larva yellowish green, dotted with reddish and dark green; the reddish dorsal stripe is spotted and margined with yellow, its red border being interrupted at the 6th and 7th segments (*Ochs.*) On sallow (*Salix caprea*). IX.

Brs. Ca.! *Ct.* Da. Ed. Ep. G. Ha. L.D. Lw.! Ly. M. Pl. Pr. St. *Wt.* Y.! Carlisle.

C. BIFIDA. 1″ 8‴—1″ 10‴. F.-w. GREYISH WHITE, with a broad dark grey central band, its hinder margin ONLY SLIGHTLY INDENTED below the costa; beyond the middle, on the costa, is a dark grey spot. VI—VIII b.

Larva pale green dotted with brown; a brown dorsal stripe on the 2nd and 3rd segments, diminishing to a blunt point; it begins again in the middle of the 4th segment and gets gradually broader to the 8th, where it reaches so far down the sides as to include the spiracles: it then diminishes gradually, and widens again on the 13th segment. On poplar. VIII —IX.

Bi.! Brg.! Brs. Bu. Ca.! Ct. Ep. Ha. Hu. K. M.! Pr. St. Wa. Y.!

C. VINULA (Puss). 2″ 6‴—3‴. F.-w. whitish, with numerous grey V-like markings beyond the middle. V—VI.

Larva dark green, with a hump on the 4th segment, then a brownish blotch (bordered with white) along the back, attaining its greatest breadth at the 8th segment (not extending so low as to include the spiracles), and thence diminishing gradually to the tail. On sallow, poplar and willow. VII—VIII.

Common everywhere.

Genus 2. STAUROPUS.

Antennæ of the male pectinated, the tip filiform; of the female filiform throughout their length: fore-wings with no projection on the inner margin.

Larva naked; anal prolegs wanting; second and third pairs of anterior legs remarkably long.

S. FAGI (Lobster). 2″ 8‴. F.-w. pale brown, grey at the base, reddish towards the inner margin; a black dot at the base; a waved, indented, yellowish, transverse streak beyond the middle; and a row of blackish spots towards the hind-margin. VI m—VII b.

Larva reddish brown, with two humps on each segment from the 5th to the 9th; the anal segments are carried erect; from the last protrude two little tails (*Dup.*) On beech, oak and birch. VIII—IX.

Rather scarce. Bl. Ep. *Ex.* Ha. Lw. Ly. *Pl.* Dursley.

Genus 3. NOTODONTA.

Antennæ pectinated in the male, simple in the female; fore-wings dark-coloured, with a projection on the inner margin; the hind-margin round.

Larva naked, with sixteen legs, with three or four humps on the back of the 5th to 8th segments, and a lesser hump on the 12th segment.

We have three species, which may be thus known :—

A. Fore-wings not with a large oval patch of various shades beyond the middle.

B. Hind-wings greyish brown. *N. dromedarius.*

BB. Hind-wings white. *N. tritophus.*

AA. Fore-wings with a large oval patch, of various shades of purple and brown, beyond the middle. *N. ziczac.*

N. DROMEDARIUS. 1″ 8‴—2‴. F.-w. smoky brown, with a reddish tinge ; a yellowish patch at the base of the costa ; 2 waved, transverse, red-brown streaks, 1 before and 1 beyond the middle ; and between them, near the costa, is a yellowish spot, with a red-brown centre : H.-W. GREYISH BROWN. VI.

Larva yellowish green ; a purplish brown dorsal stripe on the 2nd to 4th segments ; the 5th to 8th have small humps, reddish in front ; another is on the 12th. On birch. VIII.

Not an uncommon species. Bi. Brg. Brs. Ct. Ed.! Ep.! G. Ha.! L.D. Ly.! M. Pl. Pr. Sc.! Wa. Y. Carlisle.

N. TRITOPHUS. 1″ 10‴. F.-w. dull brown, with a yellowish tinge ; 2 waved, transverse, brown streaks, 1 before and 1 beyond the middle ; between these is an elongate kidney-shaped spot, of a dull ochreous, with darker centre, and connected with the costa by a patch of the same colour : H.-W. WHITE, with the cilia at the anal angle dark fuscous. V and VIII.

Larva dark green, with humps on the 5th, 6th, 7th and 12th segments : a reddish dorsal streak from the head to the 5th segment ; along the spiracles is an interrupted reddish streak (*Ochs.*) On aspen, poplar and birch. VII and IX.

Very rare, but widely distributed, and has occurred in Essex, Scotland and Gloucestershire.

N. ZICZAC (Pebble Prominent). 1″ 7‴—1″ 10‴. F.-w. pale brown, with a faint rosy tinge towards the costa ; BEYOND THE MIDDLE IS A LARGE OVAL PATCH OF VARIOUS SHADES OF PURPLE AND BROWN, with a dark brown curved line on its basal edge. V—VI and VIII.

Larva ashy grey or violet-grey, or reddish brown; three last segments ferruginous; 6th, 7th, and 8th segments each have a pyramidal hump; on each side are three pale stripes; spiracles white (*Dup.*) On poplars and sallow. VI and IX—X.

The commonest of the genus. Bi. *Brs.!* Bu. Ca.!! Da.! Ep.! Ex. G. Ha.!! Hu.! L.D.! Lw.! Ly. M. Pr. Sc.! St. Te. Wa. Wt. Y.! Carlisle.

Genus 4. Pterostoma.

Antennæ pectinated in both sexes, most strongly in the male; palpi very long, clothed with thick scales, projecting in front of the head; abdomen of the male slender; fore-wings with a conspicuous projection on the inner margin near the base.

Larva smooth, with sixteen legs, and with no protuberances.

P. palpina. 1″ 8‴—2″. F.-w. greyish ochreous, irregularly streaked with blackish, and with 2 indistinct, oblique, dark grey bands beyond the middle. VI—VII.

Larva pale green, with four interrupted dorsal white lines; a yellow line along the spiracles, edged above with black on the 2nd to 4th segments (*Dup.*) On sallow and poplar. VI and X.

Brg. Brs. Bu. Ca.! Ct. Ep. *Ex.* Ha.! L.D. Lw.! Ly. *Pl.* Sh. *St.* Tn. Wa. Y. Carlisle.

Genus 5. Ptilophora.

Antennæ highly pectinated in the male, simple in the female; wings subdiaphanous; fore-wings with no projection on the inner margin.

Larva smooth, with sixteen legs, and with no protuberances.

P. PLUMIGERA. 1″ 4‴—1″ 5‴. F.-w. reddish brown; all the veins distinctly visible as fuscous streaks; a very indistinct pale yellowish fascia beyond the middle.

Larva pale green, with a bluish green dorsal line, bordered on each side by a white line: two very slender whitish lines above the legs; belly, legs and head pale green. On maple. V—VI.

Occurs at Marlow and Halton, in Buckinghamshire.

Genus 6. DRYMONIA.

Antennæ pectinated in the male, simple in the female; fore-wings (with no projection on the inner margin) white varied with fuscous; a broad white fascia beyond the middle.

Larva smooth, with sixteen legs and with no protuberance.

We have two species, readily distinguished by the presence or absence of a black spot in the centre of the fore-wings.

D. CHAONIA. 1″ 6‴—1″ 8‴. F.-w. dark greyish brown, with 2 wavy, transverse, whitish streaks before the middle; a broad, curved, whitish central band, IN WHICH IS A BLACK SPOT towards the costa: immediately beyond is another waved, indented, white streak. V.

Larva whitish green, with a yellow line on each side of the back, and a broader yellow line along the spiracles, going from the anal prolegs to the mouth. On oak. VII.

Not a common species. Brs. *Ep.!* Ha. Ly. M. Wa. Wt. *Y.* Carlisle. Cockermouth.

D. DODONÆA. 1″ 7‴. F.-w. whitish, with a broad fuscous fascia before the middle, and two curved slender fasciæ beyond the middle; the central white band with NO BLACK SPOT. V—VI.

Larva pale bluish green, with two white lines on the back; a row of white dots on the side, and a yellowish line along the spiracles (*Freyer*). On oak and birch. VII—VIII.

Not a common species. Ct. *Ep.! Ha. L.D.* Ly. Cockermouth.

Genus 7. Gluphisia.

Antennæ broadly pectinated in the male, slightly in the female; wings short and broad; fore-wings with no projection on the inner margin, grey, with darker markings.

Larva smooth, with sixteen legs, with no protuberances.

G. CRENATA. 1″ 2‴—1″ 3‴. F.-w. brownish ochreous, with four transverse black lines and cloudy blackish bands; in the palest central portion of the wing is an ill-defined pale lunate mark. V—VI.

Larva pale green; dorsal line spotted with ferruginous, bordered on each side by a yellow line (*Dup.*) On poplar. VIII.

Very rare. Has only been taken at Epping, and at Halton, in Bucks.

Genus 8. Leiocampa.

Antennæ pectinated in the male, ciliated in the female; fore-wings (with a slight projection on the inner margin) whitish, with a dark brown stripe near the inner margin, and a blotch near the tip of costa of similar colour.

Larva smooth, with sixteen legs, the 12th segment a little thickened.

We have two species, very similar, but readily distinguished by the characters pointed out in the descriptions.

P. DICTÆA (Swallow Prominent). 1″ 11‴—2″ 4‴. F.-w. whitish, varied with pale and dark brown; in the hind-margin are several linear WHITISH streaks, the lower one WEDGE-SHAPED: h.-w. whitish; a dark brown spot at the anal angle, WITH A WHITISH LINE BETWEEN IT AND THE FRINGE. V—VII.

Larva greenish white, with a yellow stripe on each side, or dull brown (*compiled from various authors*). On poplar and willows. IX.

Commoner than the following. Bi. Bl. Brs. Bu. Ca. Ct.

Da. Ed.! Ep. G. Ha.! Hw.! L.D. Lw. M. Pl. Pr. R. Sc. Sh. Te. Tn. Y. Carlisle.

P. DICTÆOIDES (Lesser Swallow Prominent). 1″ 5‴—2″ 2‴. F.-w. whitish, varied with pale and dark brown; in the hind-margin are several linear whitish streaks, the lower one TRIANGULAR and WHITE: h.-w. whitish; a dark brown spot at the anal angle, NOT SEPARATED from the fringe by a whitish line. V—VI.

Larva deep brown, with a broad yellow band on each side, and extremely glossy, showing in certain lights a purple tinge like *Apatura Iris* (*H. Doubleday in litt.*) On birch. IX.

Bi. Brg. Brs. *Ed. Ep.!* Ha. L.D. Ly. M. Pl. Pr. Y. Cockermouth.

Genus 9. LOPHOPTERYX.

Antennæ pectinated in the male, simple in the female; fore-wings (with a distinct projection on the inner margin) brownish red or reddish grey.

Larva not hairy, with sixteen legs, with protuberances on the 12th segment only, or on several segments, or without protuberances.

We have three species, thus distinguished:—

A. Fore-wings brownish red, with no yellow costal spots.
B. Fore-wings with no pale blotch at anal angle. *L. camelina.*

BB. Fore-wings with a large whitish blotch at anal angle. *L. cucullina.*

AA. Fore-wings reddish grey, with two yellow costal spots. *L. Carmelita.*

L. CAMELINA (Coxcomb Prominent). 1″ 5‴—1″ 9‴. F.-w. brownish red, darker towards the inner margin, with two wavy and indented, blackish, transverse streaks. VI—VIII.

Larva greenish; a yellowish green line along the spiracles, which are black, and each followed by a small red spot; 12th segment with two small projecting tubercles, with red tips. On birch, hazel, &c. VIII—X.

The commonest species of the genus, and very generally distributed.

L. CUCULLINA. 1″ 5‴—1″ 6‴. F.-w. brownish red, darker towards the inner margin, with a large ochreous patch at the base of the costa; along the lower half of the hinder margin is A LARGE WHITISH BLOTCH clouded with pale grey, and intersected by a slender ochreous streak, in which is a black line. V.

Larva green or pale reddish, with a broad darker spot behind the head extending to the 5th segment; two short blunt humps on each of the middle segments; the hump on the 12th segment has the tip red (*Ochs.*) On maple. VIII—IX.

Not common. Halton, in Bucks.

L. CARMELITA. 1″ 9‴—1″ 10‴. F.-w. reddish grey, darker towards the costa; ON THE COSTA ARE TWO PALE YELLOW SPOTS, from which proceed transverse lines formed of black dots. IV m—V m.

Larva green, with a rough surface, caused by numerous raised yellow dots; a yellowish white line along the spiracles (*Freyer*). On birch. VI.

Ep. L.D. Carlisle; occurs also at Birch Wood and West Wickham Wood. This species appears to be gradually becoming commoner. A few years ago it used to be a great rarity.

Genus 10. Diloba.

Antennæ of the male pectinated, of the female simple: fore-wings (with no projection on the inner margin) grey, with two central whitish blotches.

Larva smooth and soft, with sixteen legs; no protuberances.

D. cæruleocephala (Figure of 8). 1″ 4‴—1″ ‴ F.-w. leaden grey, with a faint rosy tinge; in the middle towards the costa are two kidney-shaped whitish spots, resembling the figure 8. IX.

Larva pale yellow, with a broad, lateral, slate-blue band (or pale green); head blue spotted with black. On hawthorn and other plants. VI.

Very common and generally distributed.

Genus 11. Petasia.

Antennæ pectinated in the male, simple in the female; fore-wings (with no projection on the inner margin) grey, with darker longitudinal streaks.

Larva smooth, with sixteen legs, with the 12th segment thickened; in repose they elevate the anterior segments similarly to many of the Sphingina larvæ, as Duponchel quaintly has it, "elles semblent regarder le ciel."

We have two species, readily distinguished; moreover, one is autumnal, the other vernal.

P. cassinea (Sprawler). 1″ 6‴—1″ 7‴. F.-w. pale greyish brown, with a blackish streak from the base along the middle; beyond are numerous irregular blackish streaks. X.

Larva shining green, inclining to yellowish; three white dorsal lines and a lateral sulphur-yellow stripe on each side,

meeting round the anus (*Treitschke*). On lime, sallow, oak, &c. V—VIII.

Not rare. Brg. Brs. Bu. Ca. Ct.! Da. Ep. *Ex.* Ha. *L.D.* Ly. Pl. Pr. Sh. Te. Y. Carlisle.

P. NUBECULOSA. 1″ 1‴—1″ 8‴. F.-w. reddish grey, with black longitudinal streaks, with 2 indistinct, pale, transverse streaks, one near the base, the other, much serrated, beyond the middle; near the costa are two central pale spots. IV.

Larva green, with numerous raised whitish dots; an oblique, lateral, whitish streak on the 4th segment, and a slender yellow band across the 12th segment. On birch (and elm). V—VI.

Hitherto rare. Rannoch, Perthshire.

Genus 12. PERIDEA.

Antennæ pectinated in the male, simple in the female; fore-wings (with a slight projection from the inner margin) greyish, not densely clothed with scales.

Larva smooth, with sixteen legs; no protuberances.

P. TREPIDA. 2″ 3‴—2″ 5‴. F.-w. smoky brown, with an ochreous tinge; 2 reddish brown angulated streaks before the middle, and a curved, indented, dark brown streak beyond the middle; some red-brown spots before the hind-margin. V—VI.

Larva yellowish green, with two white dorsal lines; an oblique red stripe margined with yellow on the side of each segment (*Ochs.*) On oak. VII—IX.

Not common. Ep. Ha. Ly. M. Sh. Te. Y. Carlisle. Cockermouth.

Genus 13. CLOSTERA.

Antennæ pectinated in the male, slightly so in the female; fore-wings shorter than the body, rather broad, with transverse lines; no projection on the inner margin.

Larva rather thick and hairy, with sixteen legs and a few tubercular processes.

We have two species, readily distinguished by the size, and by the distinctness and extent of the *chocolate tip* of the fore-wings.

C. RECLUSA (Small Chocolate Tip). 10‴—1″ 1‴. F.-w. purplish grey, with 4 pale transverse streaks, the 3rd rather indistinct; the 1st and second generally unite on the costa and on the inner margin; on the costa, beyond the third streak, is a rather small reddish orange spot, NOT EXTENDING TO THE TIP OF THE WING. V.

Larva blackish grey, the back greenish grey; a row of yellow spots on the sides; along the spiracles a double yellow line; on the back of the 5th and 12th segments is a black hairy wart (*Ochs.*) On sallows, &c. IX.

Brg.! *Brs.* Ca.! Ep. *Ha.* Pm. Y. Carlisle.

C. CURTULA (Chocolate Tip). 1″ 3‴—1″ 4‴. F.-w. grey, slightly tinged with purple, with 4 yellowish transverse streaks, the 3rd indistinct, the first 2 never united; beyond the 4th a reddish brown spot OCCUPIES THE ENTIRE TIP OF THE WING, reaching nearly to the anal angle. V and ?

Larva dull reddish white powdered with black, with two rows of orange tubercles on each side; the 5th and 12th segments have each a little velvety black tubercle on the back (*Dup.*) On sallows and poplars. VI—VII and VIII—IX.

This appears to have become a scarce insect. *Brs.! Bu.* Ep. Ha. Lw. Y. Carlisle.

Genus 14. PYGÆRA.

Antennæ crenulated in the male, simple in the female; fore-wings (with no projection on the inner margin) elongate, with a pale patch at the tip.

Larva downy, with sixteen legs and no protuberances.

P. BUCEPHALA Buff Tip). 2″ 3‴—2″ 6‴. F.-w. purplish grey, hoary towards the inner margin; 2 transverse streaks, 1 before and 1 beyond the middle; the tip with a large pale ochreous or buff spot: h.-w. yellowish white. VI —VII.

Larva dark yellow; a broad black dorsal line and three black lines on each side above the spiracles: head, legs and spiracles black. On oak, lime, nut, sallow, &c. VIII m—IX m.

A very abundant species and generally distributed. The gregarious larvæ frequently strip the branches on which they feed.

Family IV. LIPARIDÆ.

Imago with the antennæ longer than the thorax, pectinated in the male; abdomen often very thick in the female, sometimes with a tuft of wool at the anus; fore-wings with no projecting tuft of scales on the inner margin; female sometimes subapterous (*Orgyia*).

Larva hairy, *generally with tufts of hair*, and frequently with two fleshy protuberances on the 12th segment; always with sixteen legs.

Pupa hairy, *generally with tufts of hair along the back;* enclosed in a cocoon of slight texture.

The larvæ of several of this Family are of great beauty: they feed on trees or shrubs, excepting that of *Lælia cænosa*, which feeds on reeds and other water-plants. All the species fly in the evening, except the two species of *Orgyia*, which fly in the day-time during the hottest sunshine.

Two species, *Pudibunda* and *Coryli*, pass the winter in the pupa state, the imago appearing in May. Of all the others the larvæ, which have hybernated in various stages of growth, may be found in May, the perfect insects appearing in June,

July or August. The larva, however, of *Orgyia antiqua*, is rarely to be found before June; but then you can go on finding it till September.

The young collector may expect to obtain *Pudibunda*, *Antiqua*, *Salicis* and *Auriflua* his first season. *Monacha*, *Dispar*, *Fascelina*, *Coryli*, *Canosa* and *Chrysorrhœa* are local species, not to be found everywhere. *Gonostigma* is rare; and *V-Nigrum*, not having been taken for many years, is considered by some not to be a British species.

The group may be tabulated thus:—

A. Antennæ filiform (or crenulated) in female.
  B. Female with fully developed wings.
    C. Above 1½ inch in expansion; fore-legs hairy. 3. Dasychira.
    CC. Under 1½ inch in expansion; fore-legs not hairy. 4. Demas.
  BB. Female with rudimentary wings. 5. Orgyia.
AA. Antennæ ciliated in female.
    D. Wings spotted.
      E. Female with pointed naked tail. 1. Psilura.
      EE. Female with round woolly tail. 2. Hypogymna.
    DD. Wings spotless or nearly so.
      F. With coloured anal tuft. 9. Porthesia.
      FF. With no anal tuft.
        G. Wings smoky white. 6. Lælia.
        GG. Wings white. 8. Stilpnotia.
AAA. Antennæ pectinated in female. 7. Leucoma.

Genus 1. Psilura.

Antennæ of the female ciliated; abdomen of the female pointed, not tufted; ovipositor generally exserted.

We have only one species.

P. Monacha (Black Arches). 1″ 5‴—2″ 1‴. F.-w. white, with numerous irregular, transverse, black markings; h.-w. smoky grey; terminal half of the body pinkish. VII —VIII.

Larva whitish; a broad brown dorsal streak, interrupted on the 4th, 8th and 9th segments; on the 3rd segment are two large black spots on the back, and on each of the 5th to 12th are two smaller black spots on the back (*Hub.*) On fir, oak and apple (*Ochs.*) VI—VII.

Bl. Brg. Ct. Ep.! Ha. Lw.! Ly.!! Pl. *Tu.* Wa.! Wt. Barnsley and Doncaster.

Genus 2. Hypogymna.

Antennæ ciliated in female; abdomen of female very thick and rounded, clothed with wool.

There is only one species in this genus.

H. dispar (Gipsey). 1″ 7‴—2″ 6‴. ♂ smoky brown, ♀ yellowish white; f.-w. with obscure darker markings; a blackish spot before the centre, and a V-like blackish central mark towards the costa. VIII.

Larva blackish brown, peppered with yellowish; a row of reddish tubercles on each side, and a row of tubercles on each side of the back, blue on the 2nd to 5th, reddish on the 6th to 12th (*Dup.*) All sorts of trees. V—VII.

This species is apparently less common here than formerly. Ha. *St.* On the Continent it is frequently to be numbered amongst injurious insects, from its abounding to such an extent as to defoliate the trees.

Genus 3. Dasychira.

Antennæ crenulated in female; fore-legs very hairy.
Larva very beautiful, with *tufts* of coloured hair down the back.

We have two species, readily distinguished by the characters hereafter given. Of one (*Pudibunda*) the larva is full-fed in the autumn: of the other the larva hybernates small, and feeds up in the spring.

D. FASCELINA (Dark Tussock). 1″ 6‴—1″ 9‴. F.-w. grey powdered with blackish; 2 blackish transverse streaks POWDERED WITH YELLOWISH; h.-w. GREY. VI.
Larva black, with yellow hairs: on the 5th to 8th segments are black tufts, with white hairs on each side; a longer black tuft on the 12th segment. On various plants. IX—V.
Seems rather partial to heathy situations. Bl. Ca.! *Ed.* Ha. *L.D.* Ly. St. Y. Lytham! Carlisle.

D. PUDIBUNDA (Pale Tussock). 1″ 10‴—2″ 4‴. F.-w. PALE grey; a short, blackish, transverse streak near the base: a slender black band before the middle; a curved, black, transverse line beyond the middle: h.-w. pale greyish brown (♀, h.-w. whitish), with a grey central band. V—VI.
Larva pale yellowish green (or reddish yellow): incisions between the 5th to 8th segments above deep velvety black, 5th to 8th each with a dense yellow tuft on the back, and the 12th with a longer dull red tuft. On hop, &c. Known in hop-gardens as the hop-dog. VIII—X.
Generally distributed and common.

Genus 4. Demas.

Antennæ of male only slightly pectinated, of female filiform; thorax crested; fore-legs not hairy.
Larva with tufts of hair.

D. Corvli. 1″ 2‴—1″ 5‴. F.-w. grey, with 2 wavy black, indented, transverse streaks, 1 before, 1 beyond the middle; the space between them is much suffused with brown, and towards the costa are two spots, an orbicular and a reniform one. V e—VI.

Larva flesh-coloured, with a broad black dorsal line; the 5th, 6th and 12th segments have tufts of reddish hairs on the back; head yellow (*Freyer*). On willow, birch, alder, sloe, beech and oak. VIII—IX.

Bl. Brs. Ct. Ep.! G. Ha.!! L.D. Lw. Ly. St. Te. Wa.

Genus 5. Orgyia.

Antennæ of female crenulated; female with rudimentary wings and large bodies; fore-legs hairy.

Larva very elegant, with pencilled tufts of hair.

We have two species, of which the males fly by day. They are readily distinguished as follows:—

A. With no white spots on the costa near the tip of fore-wing. *O. antiqua.*

AA. With several small white spots on the costa near the tip of fore-wing. *O. gonostigma.*

O. antiqua (The Vapourer). ♂ 9‴—1″ 6‴. ♂ rich brown; f.-w. clouded with darker brown; a white spot near the anal angle. VII—X.

Larva blackish spotted with pink; the 5th to 8th segments each with a tuft of ochreous hairs on the back; two long blackish tufts on the 2nd segment pointing forwards, and one on the 12th segment pointing backwards; a slender lateral tuft on each of the 5th and 6th segments. On all sorts of trees and shrubs. VI—IX.

Generally distributed and common. Abundant in the metropolis itself.

O. gonostigma. 1″ 4‴. ♂, f.-w. orange-brown; several small white spots near the tip, preceded by a

SMALL ORANGE SPOT NEAR THE COSTA; a white spot at the anal angle: h.-w. BLACKISH BROWN. VI.

Larva black, with an orange stripe on each side of the back and one on each side; the 5th to 8th segments each with a broad tuft of brownish hairs upon the back: two long blackish tufts on the 2nd segment pointing forwards, and one on the 12th pointing backwards. On bramble, hazel and oak. X—V.

Ep. Doncaster and near Coombe Wood.

Genus 6. LÆLIA.

Antennæ of male very densely pectinated, of female ciliated; fore-legs not hairy; body of female large.

Larva tufted, and with long tufts of hair in front.

L. CŒNOSA. 1″ 6‴—1″ 10‴. Smoky white; ♂, f.-w. tinged with yellow; legs yellow. VII.

Larva yellowish; 2nd segment with two long tufts of brownish hairs pointing forwards; a similar tuft on the 12th segment pointing backwards; the 5th to 8th each bear a lemon-yellow tuft on the back (*Freyer*). On reed (*Arundo Phragmites*) and *Cladium Mariscus*. VII.

Burwell Fen.

Genus 7. LEUCOMA.

Antennæ nearly alike in both sexes, pectinated, but not densely so; wings semitransparent; legs not hairy.

Larva tufted.

We have only one species, which many doubt as British.

L. VAU-NIGRUM. 1″ 7‴—2″ 1‴. Satiny white; f.-w., a black V beyond the middle near the costa. VI.

Larva black on the back; sides reddish yellow; on the back are eight tufts of hair, the three middle ones reddish yellow, the remainder white (*Ochs.*) On oak, lime and beech. V.

No certain localities are known for this species.

Genus 8. Stilpnotia.

Antennæ of male rather densely pectinated, of female ciliated; fore-legs not hairy; wings not densely clothed with scales, but more so than in *Leucoma*.

Larva not with *tufts* of hairs.

S. Salicis (White Satin). 1″ 10‴—2″ 2‴. Satiny white, spotless; legs black ringed with white. VII e—VIII.

Larva whitish, with a black line on each side of the back, interrupted by a row of red velvety tubercles; sides bluish white dotted with black, each with a row of red tubercles (*Dup.*) On poplars and willows. V and VI.

A common species in many places. Bi.! Bl. Ca.! Ep. *Ex.* Ha. K. Lw.! Le.! R.! St. Tn. Wi.!! Wt.! Southport!!

Genus 9. Porthesia.

Antennæ pectinated in male, ciliated in female; wings densely clothed with scales; abdomen tufted in both sexes; fore-legs hairy.

Larva not with dorsal tufts of hair; a tuft of hair proceeding from a little fleshy protuberance on each side of the head.

We have two species, readily distinguishable by the colour of the anal tuft.

A. Anal tuft brown. *P. chrysorrhœa.*
AA. Anal tuft yellow. *P. auriflua.*

P. chrysorrhœa (Brown Tail). 1″ 3‴—1″ 6‴. Satiny white, spotless; f.-w. rarely with a black spot near the anal angle; anal tuft golden brown. VIII.

Larva black, with reddish hairs; a white stripe on each side of the back, interrupted on each segment by a slender reddish streak; several small reddish spots on the 2nd to 4th segments, and a reddish tubercle on the back of each of the 11th and 12th segments (*Dup.*) On sloe, hawthorn, &c. V, VI.

Much less common than the following. *Ep.*! Lw.!! Ly. R. St.! Te. Tn. Lytham!!

P. AURIFLUA (Gold Tail). 1″ 3‴ — 1″ 10‴. Satiny white; f.-w. with a brownish black spot near the anal angle: anal tuft YELLOW. VIII.

Larva black, with dorsal stripe interrupted on 5th, 6th and 12th segments, on which there are small humps: a row of white spots along the reddish subdorsal lines; a reddish line above the legs. On hawthorn, apple, oak, &c. V, VI.

Throughout the South of England an abundant species, and occurring as far North as Carlisle.

Family V. LITHOSIDÆ.

Imago with the antennæ filiform in both sexes; collar well developed; thorax unspotted; abdomen unspotted, sometimes with pale belts and a pale tip; f.-w. mostly narrow.

Larva hairy; sixteen legs. Feeds on lichens.

Pupa rather short, smooth, enclosed in a cocoon.

The species of this Family are comparatively of small size, and are especially distinguished from the other groups of the Bombycina by the narrowness of the fore-wings. A *Lithosia*, indeed, has much resemblance in form to a *Crambus*. The larvæ, from their lichenivorous habits, are not often met with, and many are still unknown to us. The perfect insects are all evening flyers: they may sometimes be beaten from the branches of trees on which they repose, or they may be attracted by light.

Rubricollis is the only species known to pass the winter in the pupa state, and is therefore the earliest to appear in the perfect state. It is found in June. *Aureola* and *Irrorella* also come out towards the end of that month. July is *the*

month for this family, as then *Miniata*, *Aureola*, *Helvola*, *Complana*, *Complanula*, *Quadra*, *Mesomella*, *Irrorella*, *Mundana* and *Senex* are to be met with. The two last-named species may also be found in August, when they are joined by *Stramineola*, *Griseola*, *Pygmæola* and *Muscerda*. *Rubricollis* is in the larva state in August and September. The other known larvæ of this family are to be found in May and June.

None of the species are *rare*, though several are local; and in a few years the young collector may expect to obtain all the species. Of course he must visit Horning Fen for *Muscerda*, and Deal for *Pygmæola*. The commonest of the family are *Complanula*, *Rubricollis* and *Mundana;* and these the tyro may expect to meet with his first season, though perhaps he will hardly take *Mundana* for a moth, owing to its transparent appearance.

The family may be thus tabulated:—

A. Fore-wings moderately broad; the costa much arched. 1. Miltochrista.
AA. Fore-wings narrow. 2. Lithosia. 3. Œnistis. 4. Gnophria.
AAA. Fore-wings triangular.
B. Fore-wings opaque. 5. Cybosia.
BB. Fore-wings semitransparent. 6. Philea.
AAAA. Fore-wings short, rounded. 7. Nudaria.

Genus 1. Miltochrista.

Imago: costa of fore-wings much arched; fore-wings with transverse, wavy, dark streaks.

We have only one species.

M. miniata. 1″ 1‴. F.-w. yellow tinged with rosy; an

acutely undulated curved line beyond the middle, followed by a row of black dots. VII.

Larva dull brown, with long blackish hairs; head reddish brown, towards the mouth orange-yellow (*Ochs.*) On lichens, oaks, beech and birch. V—VI.

Not an uncommon species. Bl.! Brg.!! Brs. Ep.! Ex.! Ha. Lw.! Ly.!! Pl. Sc. St. Te. Tn.! Wt.! Y.!

Genus 2. Lithosia.

Imago: costa of fore-wings but slightly arched, sometimes almost straight; fore-wings often unicolorous, or with paler costa, rarely spotted, never with transverse lines.

There are eight species, which may be thus recognised:—

A. F.-w. spotted. *L. muscerda.*
AA. F.-w. unspotted.
  B. F.-w., costa pale, sharply defined.
    C. Pale costa of equal width to hind-margin. *L. complana.*
    CC. Pale costa attenuated towards hind-margin. *L. complanula.*
  BB. F.-w., costa pale, not sharply defined.
    D. Thorax ochreous. *L. helvola.*
    DD. Thorax grey. *L. griseola.*
  BBB. F.-w. unicolorous.
    E. H.-w. not unicolorous. *L. pygmæola.*
    EE. H.-w. unicolorous.
      F. F.-w. dark ochreous-yellow. *L. aureola.*
      FF. F.-w. straw-yellow. *L. stramineola.*

L. aureola. 1″ 2‴. F.-w. deep dull yellow. H.-w. paler. VI—VII.

Larva black, with two lemon-yellow, red-spotted, interrupted stripes on the back, on which, behind the head, in the middle

and towards the anus, are white spots (*Ochs.*) On the lichens of the fir and pine. V—VI.

Brg. Ep. Ha. Lw.

L. HELVOLA. 1″ 1‴—1″ 3‴. F.-w. dull grey, with the base, the costa broadly and the hind-margin narrowly, yellowish; h.-w. greyish. VII.

Larva black, with a black-brown head; a yellow stripe on each side of the back; on the last segments these stripes become broader, approach each other, and almost form a spot (*Treitschke*). On lichens growing on oak and beech. VI b.

Rather a scarce species. Ly. Y.

L. STRAMINEOLA. 1″ 4‴—1″ 5‴. F.-w. pale ochreous; h.-w. paler. VIII.

LARVA UNKNOWN.

Brs. Ca.! Ep. *Ha. Lw.* Lympstone.

L. COMPLANA. 1″ 3‴—1″ 4‴. F.-w. leaden grey, with a yellow stripe on the costa, of EQUAL WIDTH TO THE HIND-MARGIN. VII.

Larva black with short hairs; a yellow-, red- and white-spotted stripe on each side of the back, and a narrow reddish yellow line above the feet (*Ochs.*) On lichens growing on sloe and firs. V—VI.

Much rarer than the following. Brs. Ep. Lw.! M. Pl. *Sh.* St. Wt.

L. COMPLANULA (The Common Footman). 1″ 3‴—1″ 4‴. F.-w. leaden grey, with a yellow stripe along the costa, of equal width to beyond the middle, and THEN ATTENUATED TO A POINT AT THE TIP. VII.

Larva black, unspotted, with a narrow reddish yellow stripe from the 5th to 11th segments just above the feet (*Treitschke*). On lichens growing on walls and on poplars. V—VI.

Generally distributed and common in the South, but does not appear to occur in Scotland.

L. GRISEOLA. 1″ 4‴—1″ 5‴. F.-w. PALE GREY, with the costa narrowly yellowish; h.-w. yellowish grey. VIII.
LARVA UNKNOWN.
Bi. Brg.! Brs.! Ca.! Ep.!! Ex.!! Ha.!! K.! Sw. Sc.! Wa! Lympstone!!

L. PYGMÆOLA. 11‴—1″. F.-w. pale yellowish grey, with the costa pale yellowish; H.-W. PALE YELLOW, DARK GREY TOWARDS THE COSTA. VIII.
LARVA UNKNOWN.
On the coast at Deal.

L. MUSCERDA. 1″—1″ 2‴. F.-w. pale brownish grey; the costa sometimes paler at the base; TWO BLACK DOTS near the middle of the inner margin, and FOUR BLACK DOTS from beyond the middle of the costa towards the anal angle. VIII.
LARVA UNKNOWN.
Occurs in Horning marshes, near Norwich.

Genus 3. ŒNISTIS.

Imago: costa of fore-wings slightly arched; fore-wings with a pale blotch at the base or spotted, never with transverse lines.

We have but one species, of which the sexes are very different in appearance. It is readily known by its large size, and is appropriately named "The Large Footman."

Œ. QUADRA (The Large Footman). 1″ 9‴—1″ 11‴. ♂, f.-w. dull grey, darker towards the hind-margin; the base yellow, with a black patch on the costa: ♀, f.-w. deep yellow, with 2 conspicuous black spots beyond the middle. VII.
Larva blackish grey, with a double, toothed, yellow line on each side of the back, in which are placed scarlet hairy warts; a black spot on the 2nd, 7th and last segments: head black. (*Ochs.*) On lichens growing on oak, beech, &c. V—VI.
Brg. *Brs.* Do. Ep. *Ha.* Ly.!! M. R. Sc. Wa.

Genus 4. Gnophria.

Imago: fore-wings, costa but slightly arched; wings unicolorous.

There is but one species.

G. rubricollis. 1″ 1‴—1″ 4‴. Dull smoky black, with reddish collar and yellow tail. VI.

Larva greenish grey, with black longitudinal stripes spotted with red and white; head dark brown, with two white lines (*Ochs.*) On various lichens. VIII—IX.

Common in many places. Bl. Brg.! Ca.!! Ct.!! Ep.! *Ex.* Ha.!! L.D.! Lw.! Ly. M. Pl. St. Wa. Wi.!! Wt. Y.! Lympstone, Dursley, Guisboro', Carlisle; also at Thornhill, Dumfriesshire.

Genus 5. Cybosia.

Imago: fore-wings opaque, spotted, triangular, the costa slightly arched.

We have only one species.

C. mesomella. 1″ 2‴—1″ 4‴. F.-w. whitish, with yellowish costa and hind-margin; a black dot on the costa beyond the middle, and one nearly opposite towards the hind-margin; h.-w. greyish brown, paler towards the base, with yellowish cilia. VII.

Larva greyish, with a blackish stripe on each side of the back; head reddish (*Hubner*). On lichens. V?

Bl.! Brg.! Ca! Ep. *Ex.* Ha. Lw. Ly.! Tn.! Wa.! Y.! Ashburton and Chatmoss; Carlisle!

Genus 6. Philea.

Imago: fore-wings semitransparent, spotted, triangular, the costa nearly straight.

We have but one species, which, when caught, falls down in the net as though dead.

P. IRRORELLA. 8‴—1″ 5‴. Dull yellow; f.-w. with 3 oblique rows of black dots, 1 before the middle, 1 rather beyond the middle, and the 3rd near the hind-margin, the number of dots in this last varying from 1 to 6; h.-w. with 1 or 2 blackish dots at the outer angle. VI—VII.

Larva black, with a yellow dorsal line of lozenge-shaped spots, and longish lateral spots (*Ochs.*) On various lichens. V.

Brg. !! Ha. Wt. Newhaven and Shoreham, and Woodchat Park, Gloucestershire; Oban.

Genus 7. NUDARIA.

Imago: fore-wings short, rounded, slightly clothed with scales or very transparent, with transverse dark markings.

Of this genus we have two species, readily distinguished by the characters hereafter given.

N. MUNDANA. 10‴—11‴. Very TRANSPARENT, pale brownish yellow; f.-w. with 2 DISTINCT ANGULATED BANDS, 1 before and 1 beyond the middle; a distinct black spot IN the middle towards the costa, and an indistinct fuscous band towards the hind-margin; H.-W. SPOTLESS. VII—VIII.

Larva dull bluish grey, with a sulphur-yellow dorsal stripe; head and a conspicuous spot on the back of the 8th segment black (*Freyer*). On lichens. V e—VI b.

Common: generally distributed.

N. SENEX. 10″—11‴. Dull ochreous, HARADLY TRANSPARENT; f.-w. with a black spot BEYOND the middle near the costa; towards the base are THREE BLACK DOTS obliquely placed; before the hind-margin is an indistinct BAND OF BLACK DOTS: h.-w. with an indistinct BLACK SPOT near the costa. VII e—VIII.

Larva unknown.
Ca.! Ep.! Ha.!! *Lw. Sh.* St. *Te.* Y.!

Family VI. CHELONIDÆ.

Imago: antennæ generally pectinated in male, though sometimes filiform; collar well developed; thorax sometimes spotted; abdomen gaily coloured and spotted; wings gaily coloured and spotted, hind-wings sometimes especially so.

Larva hairy, not having tufts of hair; sixteen legs; generally polyphagous. Feeding on low plants.

Pupa smooth, enclosed in a cocoon.

This Family contains the most splendid and gaudily coloured of our British moths. The unlearned always take them for butterflies, as though it were an axiom that beauties must be butterflies, and that moths were always miserable-looking: entomologists know of no such distinction.

The palm of beauty must, we think, be accorded to the Cream-spot Tiger (*Arctia villica*); but the Scarlet Tiger (*Hypercompa dominula*) is hardly less splendid; and *A. caja* and *Nemeophila Plantaginis* would always attract attention by their gay appearance.

Many of the species fly in the hot sunshine, though a few (as the Ermines) are more partial to the shades of evening.

The larvæ of a few of the species pass into the pupa state before the approach of winter; but more generally the larvæ hybernate, and feed up in the spring; and the early sunny days in April we may see the Tiger caterpillars busily engaged discussing some dock or nettle on a weedy bank. Later in the season we find these large brown caterpillars wandering in all directions; and probably there are few children above eight

years of age who are not well acquainted with the larva of *A. caja*, however little they may know of the insect it produces.

In May *Plantaginis*, *Fuliginosa* and *Mendica* appear in the perfect state; in June *Dominula*, *Russula*, *Villica*, *Plantaginis*, *Fuliginosa*, *Menthastri*, *Papyratia*, *Lubricepeda*, *Mendica* and *Jacobææ* may be met with; in July *Menthastri* and *Lubricepeda* continue to occur, and *Caja*, *Grammica* and *Cribrum* appear in the perfect state. *Pulchella* (for which we have often trudged along many a stubble field in vain) does not appear till September.

The commonest of the family are *Caja*, *Menthastri*, *Lubricepeda* and *Jacobææ;* and the collector must indeed be green who does not find these his first season. *Papyratia*, *Grammica* and *Pulchella* are rare, and one may collect for many years without obtaining either. *Cribrum* is less rare now than formerly, though local, occurring in the New Forest. The other species, *Dominula*, *Russula*, *Villica*, *Plantaginis*, *Fuliginosa* and *Mendica* are moderately common in many localities, and may be obtained by using due diligence.

The family may be thus tabulated:—

A. Antennæ of male pectinated.
  B. F.-w. narrow. 9. Eulepia.
  BB. F.-w. broad.
    C. F.-w. rather transparent. 7. Diaphora.
    CC. F.-w. densely clothed.
      D. F.-w. pale, with minute black dots. 6. Spilosoma.
      DD. F.-w. with one central spot. 2. Euthemonia.
      DDD. F.-w. streaked and spotted. 3. Arctia. 4. Nemeophila.
AA. Antennæ of male filiform.
      E. F.-w. semitransparent. 5. Phragmatobia.
      EE. F.-w. densely clothed with scales.

F. H.-w. red.
G. H.-w. spotted. 1. Hypercompa.
GG. H.-w. spotless. 8. Callimorpha.
FF. H.-w. white, spotted. 10. Deiopeia.

Genus 1. Hypercompa.

Imago: antennæ filiform in both sexes; hind-wings red, spotted.

We have only one species.

H. Dominula (Scarlet Tiger). 2″ 1‴—2″ 4‴. F.-w. dark green, with yellow and white spots; h.-w. crimson, with black spots towards the margins. VI.

Larva black, with short blackish hairs placed on shining black warts; a broad pale yellow stripe on the back and one on each side much intersected by the black ground-colour. On numerous low plants. VIII—V.

Bl.! Brs. *Ex.* Ha.! Wi. Ashburton! Burwell Fen!

Genus 2. Euthemonia.

Imago: antennæ of male slightly pectinated; fore-wings with one central spot; hind-wings rather dull; female smaller than male.

There is only one species in this genus.

E. Russula (Clouded Buff). 1″ 6‴—1″ 10‴. ♂, f.-w.

pale yellow, WITH THE MARGINS REDDISH; a central black spot margined with reddish near the costa; ♀, f.-w. orange, with reddish orange veins, and a darker central spot towards the costa. VI.

Larva black brown, with a yellow red-spotted dorsal line and white spiracles; hairs reddish (*Ochs.*) On plantain, dandelion, and other low plants. IX—V.

Occurs in heathy places, amongst fern. Bl. !! Brg. ! Do. Ep. Ha. Lw. Lc. Ly. !! Pl. Pr. Sc. ! St. Te. Wt. Y. ! Guisboro ! Haldon, near Exeter; and Chatmoss.

Genus 3. ARCTIA.

Imago: antennæ pectinated in male; fore-wings streaked and spotted: hind-wings very gaily coloured and spotted.

We have two species, readily distinguished as follows:—

A. Hind-wings reddish orange, with blue-black spots. *A. caja.*

AA. Hind-wings yellow, with a black spots. *A. villica.*

A. CAJA (Tiger). 2″ 1‴—2″ 11‴. F.-w. brown, with numerous irregularly ramifying whitish streaks and spots: H.-W. REDDISH ORANGE, with 6 or 7 BLUE-BLACK spots. VII.

Larva black, with long white hairs on the back; reddish brown hairs along the sides and on the anterior segments: HEAD AND LEGS BLACK. On various low plants. IX—VI b.

Common everywhere: generally abundant.

A. VILLICA (Cream-spotted Tiger). 2″ 1‴ — 2″ 5‴.

F.-w. black, with about 8 creamy white spots; H.-W. DEEP YELLOW, with 4 or 5 small central BLACK spots, and an irregular black patch at the anal angle. VI.

Larva black, with brown hairs; HEAD AND LEGS DULL REDDISH. On various low plants. IX—V.

Bl.! Brg.!! Brs.! Ep. Ex.! K. Lw. Ly.! Pl.! Te.! Tn. Tr.!! Wt.!

Genus 4. NEMEOPHILA.

Imago: antennæ pectinated in male; fore-wings streaked and spotted; hind-wings less gaily coloured than in the preceding genus, streaked and spotted with black.

We have but one species.

N. PLANTAGINIS (Wood Tiger). 1″ 5‴—1″ 6‴. F.-w. black, with whitish streaks and spots, tinged with yellow at the margins; h.-w. dull deep yellow, with the base and inner margin black, and black spots on the hind-margin. V e—VI.

Larva dull brown; 2nd, 3rd, 4th, 11th, 12th and 13th segments with rather long blackish hairs, the intermediate segments with ferruginous hairs (*Dup.*) On plaintain. IX—IV.

Brg.! Ct.! G. Ha. Hu.!! L.D. Lw. M. Pr. Sc.!! Te. Wi. *Wt.* Y.! Dursley; Dovedale; Castle Eden Dene; Pentland Hills; Carlisle!

Genus 5. PHRAGMATOBIA.

Imago: antennæ filiform in both sexes; wings semi-transparent; fore-wings dull; hind-wings faintly tinged with rosy.

P. FULIGINOSA (Ruby Tiger). 1″ 2‴—1″ 5‴. F.-w. reddish brown, with a black spot beyond the middle; h.-w. black or dull pink, with black margins; 2 central black spots; fringes pink. VI—VII.

Larva yellowish brown, inclining to blackish, with brownish

hairs (*Ochs.*) On dock, nettle, plantain, and other low plants. IX—IV.

Generally distributed, and not uncommon.

Genus 6. Spilosoma.

Imago: antennæ pectinated in male; wings white or buff, with black spots; abdomen deep yellow, spotted with black.

We have three species, thus distinguished:—

A. Wings white.
  B. Fore-wings with many spots; hind-wings with about four spots. *S. menthastri.*
  BB. Fore-wings with few spots; hind-wings spotless. *S. papyratia.*
AA. Wings buff. *S. lubricepeda.*

S. menthastri (White Ermine). 1″ 7‴—1″ 9‴. F.-w. whitish, more or less tinged with yellow; numerous black spots more or less arranged in 4 curved transverse rows. VI—VII.

Larva black, with long brown hairs; an orange stripe straight down the back; spiracles white. On all low plants. VIII—IX.

Common everywhere: generally abundant.

S. papyratia. 1″ 6‴—1″ 8‴. F.-w. whitish, with 2 black dots beyond the middle near the costa, and with 1 or more small black dots towards the tip; H.-W. WHITE, SPOTLESS. VI.

Larva dark brown, with long hairs; spiracles yellow (*Hub.*) On various low plants (*Ochs.*) IX.

Ca. *Lw. M.* Pr. Wa. Wi. Not a common species.

S. LUBRICEPEDA (Buff Ermine). 1″ 6‴—1″ 9‴. Pale ochreous; f.-w. with 2 or 3 black spots near the base, placed in a straight row; 2 black spots near the middle of the costa, and an oblique row of black spots from the apex to the inner margin: h.-w. with 2 or 3 black spots. VI—VII.

Larva whitish, with long pale brown hairs; a broad dark grey stripe, darkest at its lower edge, on each side of the slender whitish dorsal line; sides with pale grey oblique stripes. On all low plants. VIII—IX.

Common everywhere: generally abundant, but not occurring in Scotland.

Genus 7. DIAPHORA.

Imago: antennæ pectinated in male; fore-wings rather transparent; colours differing in the two sexes; abdomen concolorous with hind-wings, and with darker spots.

There is only one species.

D. MENDICA. 1″ 3‴—1″ 7‴. ♂ smoky black, ♀ smoky white; f.-w. with 8 to 10 black spots, irregularly placed; h.-w. with 5 or 6 black spots. V—VI.

Larva brownish green or grey, with a paler dorsal line; head and legs reddish (*Ochs.*) On dock, plaintain, nettle, and various low plants. VII—IX.

Rather a common species. Bi. Brs.! *Bu.* Ca.! Ct.! Da.! Ep.! Ex.! Ha. Hu.!! *Lw.!* Ly.! M. Pl.!! Pr. Sc.! Sh.! St.! Te. Tn. Wi. Y.

Genus 8. CALLIMORPHA.

Imago: antennæ filiform in both sexes; hind-wings red, spotless; abdomen spotless.

We have only one species.

C. JACOBÆÆ. 1″ 3‴—1″ 5‴. F.-w. smoky grey, with a narrow red stripe near the costa, and 2 red spots on the hind-margin; h.-w. red, with blackish margin. VI.

Larva slightly hairy, black, annulated with orange-yellow; head black (*Ochs.*) On *Senecio Jacobæa* (ragwort), generally in companies. VII—VIII.

Common and generally distributed in England; in Scotland a great rarity.

Genus 9. Eulepia.

Imago: antennæ slightly pectinated in male; fore-wings narrow, elongate, pale, with black markings.

We have two species, thus distinguishable:—

A. Wings yellow. *E. grammica.*
AA. Fore-wings whitish; hind-wings grey. *E. cribrum.*

E. grammica. 1″ 4‴—1″ 5‴. F.-w. pale buff, with 6 to 7 longitudinal black streaks; h.-w. yellowish, with moderately broad blackish margin, and black central lunule. VII?

Larva black-brown, with an orange-yellow dorsal stripe, white lateral line, and reddish hairy warts (*Ochs.*) On *Festuca duriuscula* (fescue-grass), *Calluna vulgaris* (heather), &c. V.

Has occurred at Windsor and the Isle of Anglesea.

E. cribrum. 1″ 4‴. White, with 4 blackish bands slightly interrupted; 2 blackish streaks, 1 on the disk and 1 on the fold; on the former are 2 black dots beyond the middle: h.-w. grey, with darker margin. VII.

Larva black, with short black hairs; a white dorsal line and finer whitish lateral lines (*Freyer*). On *Calluna vulgaris* (heather). VIII—V.

Blandford, and in the New Forest.

Genus 10. Deiopeia.

Imago: antennæ filiform in both sexes; fore-wings white, gaily spotted with red and blue-black.

We have only one species in this genus. It is one of the prettiest, most elegant insects we have, and might justly be prized for its beauty, as well as for its rarity.

D. PULCHELLA. 1″ 5‴—1″ 8‴. F.-w. whitish, with 5 transverse wavy series of crimson spots, intermixed with 6 wavy transverse series of blue-black spots: h.-w. milky white, with an irregular blackish margin towards the outer angle. IX.

Larva bluish grey, with black hairs; a broad white dorsal stripe; black spots; and a red band, interrupted in the middle, on each segment (*Ochs.*) On *Myosotis arvensis* (field forget-me-not). VII.

Ep. M. St. Wt. A very scarce species. It has the reputation of being generally found in stubble fields.

Family VII. BOMBYCIDÆ.

Imago: antennæ pectinated in male, generally filiform in female; abdomen not gaily coloured or spotted; hind-wings paler than fore-wings, and with faint markings.

Larva hairy, not with tufts of hair.

Pupa smooth, enclosed in a cocoon, which is sometimes of very firm texture.

This Family does not, with us, comprise many species. We miss in the perfect insects the gay colouring of the *Chelonidæ;* yet the larvæ of many species are excessively beautiful; and one needs but to mention the Eggar, the Drinker and the Lackey to recal to the mind of the reader three very splendid larvæ.

The species are of very various sizes, *Trichiura Cratægi* being under 1½ inch in expanse, whereas *Lasiocampa Quercus* and *Gastropacha quercifolia* both attain a size of 3 inches.

The males of *Lasiocampa Quercus* (and, I believe, also of *Trifolii*) fly briskly in the middle of the day; and those who are so fortunate as to have bred a female, by taking her to the hunting-grounds of the other sex, may speedily obtain as many

specimens as they require; for the males will be so bold in pursuit of the object of their affections that they will not hesitate to enter even the pocket of the collector, if the "ladye-love" is ensconsed in a box therein.

"None but the brave deserve the fair."

The other species which fly at dusk, or after dark, may also be readily "assembled," as the phrase is, by the charms of a recently hatched female.

This mode of enticing specimens is not peculiar to this family, though I know of no species that assembles so vigorously as the Oak Eggar; it may, however, be satisfactorily tried with many of the LIPARIDÆ and CHELONIDÆ, as well as with *Endromis versicolora* and *Saturnia Pavonia-minor*.

With the exception of *Eriogaster Lanestris*, which appears in February, *Trichiura Crataegi* in September, and *Pœcilocampa Populi* in November and December, all the other species appear in the perfect state between April and August, having passed the winter in the larva state. *Ilicifolia* appears at the end of April and in May; in the latter month *Rubi* also appears. In May and June every species but the two just named may be collected in the larva state. In July *Quercus*, *Castrensis*, *Neustria*, *Potatoria* and *Quercifolia* appear in the perfect state; and they may likewise be met with in August, when *L. Trifolii* also appears.

The commonest of the family are *Rubi*, *Quercus*, *Lanestris*, *Neustria*, *Potatoria* and *Quercifolia*; and these the young collector may reasonably expect to get his first season. *Trifolii* is a coast insect, though abundant in most places on the coast; and *Castrensis* is partial to the muddy banks of the Thames

below Erith. *Populi* and *Cratægi* are hardly to be called scarce; and *Ilicifolia* will no doubt become common when more sought for in its moorland haunts.

The family may be thus tabulated:—

A. Antennæ of male deeply pectinated.
  B. Palpi inconspicuous. 1. Lasiocampa.
  BB. Palpi forming a beak. 6. Odonestis.
AA. Antennæ of male slightly pectinated.
  C. Palpi beaked; hind-margins of wings dentate. 7. Gastropacha.
  CC. Palpi not beaked: hind-margins of wings not dentate.
    D. Wings densely clothed with scales.
      E. Wings grey. 4. Trichiura.
      EE. Wings ochreous or brown. 5. Clisiocampa.
    DD. Wings sparingly clothed with scales. 2. Eriogaster.
    DDD. Wings semitransparent. 3. Pœcilocampa.

Genus 1. Lasiocampa.

Imago: antennæ deeply pectinated in male, serrated in female; abdomen of female large or moderately large, but not tufted; wings densely clothed with scales, or (as in *L. Rubi*) rather diaphanous.

Larva not gregarious.

Pupa in a cocoon, which is firm and egg-shaped (whence the term *Eggars*), or of slighter texture and fusiform (as in *L. Rubi*)

We have three species, which may be thus tabulated:—

A. Fore-wings spotless. *L. Rubi.*
AA. Fore-wings with one central white spot.
  B. Pale band of fore-wings narrow, oblique. *L. Trifolii.*
  BB. Pale band of fore-wings broad, nearly straight. *L. Quercus.*

L. Rubi (Fox). 1″ 10‴—2″ 6‴. ♂ reddish brown, ♀ purplish brown; f.-w., 2 central, pale yellowish, transverse lines, 1 before and 1 behind the middle. V e—VI.

Larva with long hairs, golden brown on the back, black between the segments: sides, head, legs and prolegs black. On heath, &c. VIII—IX.

Common and generally distributed.

L. Trifolii. 1″ 11‴—2″ 9‴. Pale reddish brown; fore-wings, a central white spot towards the costa; a NARROW, curved yellowish band extending FROM THE COSTA NEAR THE TIP TO THE MIDDLE of the inner margin. VIII.

Larva black, with pale tawny hair on the back, greyish on the sides; a bluish white stripe on either side of the back; an orange-red spot on each side of the back, on the 3rd and 4th segments. On clover, lucerne, melilot and broom. IX—VI.

This species appears especially attached to the coast. Bi.! Bl.! Ly. Pl.!! R.! Te. Lytham! Eastbourne.

L. Quercus (Oak Eggar). 2″ 4‴—3‴. ♂ rich chocolate-brown; beyond the centre a deep yellow band, which shades into chocolate at the hind-margin; f.-w., a white central spot towards the costa, and sometimes an ochreous patch towards the base; ♀ similar, but the chocolate-colour is replaced by tawny. VII—VIII.

Larva black, with rusty greyish hairs; a lateral white stripe above the white spiracles; above this, on the 3rd and 4th segments, is a red-centred white spot on each side. On various plants. VIII—V.

An abundant species, and generally distributed.

The specimens occurring in Scotland and Cornwall are much darker than the typical specimens; besides, the larva, then twelve months old, forms its cocoon in September, and the moth appears early in June. It is a subject which will probably yet repay further investigation, as the question of the extent of the variation of species is still little understood.

Genus 2. Eriogaster.

Imago: antennæ pectinated in male, simple in female; abdomen very stout in female and slightly tufted; wings not *densely* clothed with scales.

Larvæ gregarious throughout their lives.

Pupa enclosed in a firm egg-shaped cocoon.

E. lanestris (Small Eggar). 1″ 4‴—1″ 9‴. F.-w. pale purplish chocolate, with whitish basal and central spots; between the latter and the hind-margin is a faint, whitish, linear band. II.

Larva blackish blue, with two rows of hairy reddish yellow warts on the back, and three white spots between these on each segment; a white line on each side (*Ochs.*) On sloe, hawthorn, &c. V—VI.

Bi.!! Brg.! *Brs.!!* Bu.!! Ca.! Ct.! Da.!! Do. Ep.! Ex. Ha.! Hu.!! L.D.!! Lw.!! Lc. Pr.!! Sc.!! St. Te.! Wa. Wi.!! Y.!!

The larva being gregarious throughout its life, the species is abundant wherever it occurs.

Genus 3. Pœcilocampa.

Imago: antennæ of male pectinated, of female simple; abdomen moderately stout, not tufted; wings moderately clothed with scales.

Larva not gregarious, with long hairs on the sides above the legs.

Pupa enclosed in a firm oval cocoon.

P. Populi (December). 1″ 5‴—1″ 8‴. F.-w. bluish black, with an orange patch at the base, margined outwardly with a pale, transverse, yellow line; beyond the middle is a pale yellow, curved, indented, transverse line. XI e—XII.

Larva grey marbled with ochreous, with a dark grey band on each segment, in which are several whitish spots; subdorsal line orange, interrupted; two red spots on the back of the 2nd

segment. On hawthorn, poplar, lime and oak; often in the chinks of the bark. V—VI.

Bi.! Bl. *Brg.!* Brs.! Bu. Ca. Ct. Da.! Ep.! Ha.! Hu. K. L.D.! Lw. Ly. M. Pl. Pr. Sh.! St. Te. Wa. Y.!

Genus 4. Trichiura.

Imago: antennæ pectinated in male, ciliated in female; abdomen slightly tufted, the tuft bifid in the male; wings densely clothed with scales.

Larvæ gregarious when young, dispersing before attaining their full size.

Pupa enclosed in a very firm cocoon, of an oval shape.

T. Cratægi. 1″ 3‴—1″ 5‴. ♂, f.-w. pale grey, with a darker central band, bordered inwardly by an indented black line which runs obliquely up to the middle of the base, and outwardly by a sharply indented black line: ♀ brownish grey, with a central darker band; the other markings indistinct. IX.

Larva bluish black; two red hairy warts on each segment, and between them a white or yellow stripe; on each side a row of white spots (*Ochs.*) On hawthorn, sloe and sallow. V—VI.

Bl. Brs. Bu. Da. Do. *Ep.!* Ha. L.D.! *Lw.* Ly. Pr. Sh. *St.* Wa. Y.! Carlisle.

Genus 5. Clisiocampa.

Imago: antennæ pectinated in male, ciliated in female; abdomen of female rather stout and pointed; wings densely clothed with scales.

Larva gregarious when young, dispersing before becoming full-fed.

Pupa enclosed in a cocoon, of moderately firm texture, not transparent, because intermixed with a sulphur-coloured powder.

We have two species, thus distinguished :—

A First streak on fore-wings of male terminating in the base. *C. castrensis.*

AA. First streak on fore-wings of male terminating in the inner margin. *C. neustria.*

C. CASTRENSIS (Ground Lackey). 1″ 2‴—1″ 7‴. ♂, f.-w. pale ochreous, with 2 reddish brown transverse streaks; beyond the second is frequently a cloudy brown band; h.-w. BROWN: ♀ reddish brown; f.-w. 2 indistinct pale bands. VII—VIII.

Larva many-coloured; an INDISTINCT WHITISH dorsal line, then a broad orange-brown stripe; below this is a silvery grey stripe, in which, on each of the 3rd, 4th, 5th and 12th segments, is a black spot; hairs ALL GOLDEN BROWN, and longer than in *Neustria*. On *Artemisia maritima* (sea wormwood), *Plantago lanceolata* (plantain), and *Daucus Carota* (wild carrot)—(*Curtis*). V—VI.

A maritime insect, found on the banks of the Thames below Erith.

C. NEUSTRIA (Lackey). 1″ 2‴—1″ 7‴. Varies from pale ochreous to sandy red; f.-w. with 2 transverse brown streaks from the costa TO THE INNER MARGIN; the intervening space sometimes darker. VII—VIII.

Larva many-coloured; a BRIGHT WHITE dorsal line, then a broad orange stripe (intersected down the middle by a black and blue stripe), then a silvery blue stripe, in which, on each of the 3rd, 4th and 12th segments, is a black spot; hairs DARK BROWN ABOVE, golden brown towards the legs. On orchard and other trees. V—VI.

Excessively abundant and generally distributed in the South of England, but not occurring further North than York, where it is rare.

Genus 6. ODONESTIS.

Imago: antennæ of male deeply pectinated, slightly pectinated in female. Palpi long, forming a beak in front; abdomen of female thick, of male slightly tufted.

Larva not gregarious.

Pupa enclosed in a somewhat dense elongated cocoon, pointed at each end.

O. POTATORIA (Drinker). 2″—2″ 6‴. ♂ dull reddish yellow; ♀ deep yellow; f.-w., a small white central spot, a white dot between it and the costa, and an oblique dark line from the apex to the inner margin. VII—VIII.

Larva dull dark bluish grey, with a subdorsal line of orange spots on each side; along the spiracles are short white tufts of hair and oblique orange streaks. On grasses. X—V e.

Generally distributed and very common.

Genus 7. GASTROPACHA.

Imago: antennæ pectinated in male, hardly less so in female; palpi projecting in front, forming a beak; abdomen of female very thick; hind-margins of wings dentate. When reposing, the costa of the hind-wings projects considerably beyond the costa of the fore-wings.

Larva not gregarious, with fleshy protuberances on each side above the legs.

Pupa enclosed in a rather firm cocoon, of an elongate oval form.

The two species, independently of size, are distinguishable as follows:—

Fringes unicolorous. *G. quercifolia.*
Fringes spotted. *G. ilicifolia.*

G. QUERCIFOLIA (Lappet). 2″ 2‴—3″ 3‴. Brownish red clouded with blackish; f.-w. with 3 angulated, indented, black streaks, and an indistinct central black spot. VI.

Larva variable, grey or dull reddish; a slight hump on the 12th segment; the incisions between the 2nd and 4th segments blue-black; a more or less distinct whitish lateral stripe,

sometimes very broad and obliquely placed. On sloe, willow, &c. V—VI.

Ca.! Ep.! Ex. K. Lw. Ly. St. Wi.

G. ILICIFOLIA. 1″ 6‴—1″ 8‴. F.-w. rusty grey, with 2 oblique lines of blackish dots before the middle, and an oblique whitish band, not reaching to the costa, beyond the middle. Fringe of all the wings ferruginous, varied with pale yellowish. IV e—V m.

Larva grey, with reddish hairs; a broad black dorsal line, interrupted on each segment by a reddish spot, and a white stripe on each side of it; a broad, bluish, lateral stripe (*Hub.*) On sallow and bilberry (*Vaccinium myrtillus*). VI—VIII.

Cannoch Chase, and near Sheffield.

At Leipsig it is nearly every year brought for sale in the market in hundreds, by the country people, who gather bilberries. This may prove a useful hint to some of our own bilberry-gatherers.

Family VIII. ENDROMIDÆ.

Imago: antennæ pectinated in male, only slightly pectinated in female; hind-wings slightly paler than fore-wings, and with similar markings; wings without any eye-like spots.

Larva smooth, with the 12th segment thickened.
Pupa in a loose cocoon beneath moss.

This Family only contains one British species; though it is not improbable that the other European species, *Aglia Tau*, will eventually be found here. (The male *Tau* flies swiftly in beech woods, during the day, early in May). *Versicolora* flies in the first half of April, *by day*. It is not easy to catch even when you see it. It is more easily obtained by rearing the larva. The young collector must not be impatient if he should not collect it his first season.

Genus 1. Endromis.

E. versicolora (Kentish Glory). ♂ 2″ 4‴, ♀ 2″ 8‴. F.-w. orange-brown; a white patch at the base; a curved, black, transverse streak before the middle, inwardly margined with white; a black V-like mark in the middle towards the costa; a much-indented, curved, black, transverse streak beyond the middle, outwardly margined with whitish; several white streaks running into the hind-margin. IV.

Larva whitish green, attenuated anteriorly; a pyramidal hump on the 12th segment. On each side of the back are ten oblique white streaks; sides dotted with black and ferruginous; spiracles white (*Dup.*) On birch. VII.

Brg. Brs. Ct. Ipswich; and St. Leonard's Forest, Horsham. Rannoch.

Family IX. SATURNIDÆ.

Imago: antennæ pectinated in both sexes; wings broad, of similar colours and markings, each with an eye-like spot.

Larva with short bristles arranged like stars on the tubercles.

Pupa enclosed in a pear-shaped firm cocoon, open at the narrow end, but with a protecting cap inside.

This Family, like the preceding, contains but one British species; but, unlike the Kentish Glory, the Emperor Moth is almost everywhere abundant, though generally obtained in the larva state. The adult larva is very pretty; it is often found upon heather in the autumn.

Genus 1. Saturnia.

S. Pavonia-minor (Emperor). ♂ 2″ 3‴—2″ 4‴, ♀ 2″ 8‴—2″ 10‴. Near the centre of each wing a dark eye-like spot, consisting of a roundish black spot in a yellow ring, surrounded by a black ring, between which and the basal side of the yellow ring is a whitish crescent; ♂, f.-w. rosy brown, h.-w. dull orange; ♀ soft grey, all the wings with a brown marginal band. V.

Larva green; each segment with seven pink tubercles in black rings, each tubercle bearing a tuft of short black hairs; spiracles orange. On heath, &c. VIII—IX.

Common and generally distributed.

Family X. PLATYPTERIGIDÆ.

Imago: antennæ of male pectinated, of female mostly filiform; abdomen slender in both sexes; wings of small size, comparatively broad, sometimes hooked.

Larva not hairy, with several little prominences on the back, with fourteen legs; the anal prolegs wanting, thus resembling Cerura.

Pupa enclosed in a cocoon amongst leaves.

There is something startling in arriving, immediately after such splendid large insects as the Kentish Glory and the Emperor, at such diminutive representatives of the Bombycina as *Cilix spinula* and the little *Drepanæ*. The connecting links must be sought for among the exotic species.

The slender form of the species of this Family has often caused them to be mistaken for Geometrina, from which group they are at once removed by a reference to the larvæ.

All the species (with the exception perhaps of *Sicula*) appear to be double-brooded, appearing in the perfect state in May and August, and as larvæ in June and September.

Sicula is the only species which is rare with us. *Unguicula*, though local, is abundant in many beech woods. The young collector may expect to get *Spinula* his first season, and probably *Hamula*, *Falcataria* or *Lacertinaria;* at any rate, he will get all these in a few years, besides *Unguicula*, if he visits its haunts.

This Family contains three genera, which may be thus tabulated:—

A. Fore-wings rounded. 1. Cilix.
AA. Fore-wings hooked.
B. Hind-margin of fore-wings toothed. 2. Platypteryx.
BB. Hind-margin of fore-wings not toothed. 3. Drepana.

Genus 1. Cilix.

Imago: antennæ of female perfectly filiform; fore-wings rounded. Wings in repose almost vertical, meeting at their inner margins over the back.

C. spinula. 11‴. F.-w. white, with a large brown blotch on the middle of the inner margin, and a large, oval, greenish grey spot in the middle of the wing; hind-margin clouded with dark grey. V—VI and VIII.

Larva dull chocolate-brown, with a pair of conspicuous tubercles on each of the 3rd and 4th segments; on the 4th segment begins a dark tawny rhomboidal spot on the back, a dusky prolongation of which is continued towards the anal segment. On sloe and hawthorn. V e—VI b and VII e—VIII.

Common and generally distributed throughout England.

Genus 2. Platypteryx.

Imago: antennæ of female ciliated; fore-wings hooked at the tip, and with the hind-margin dentate. Wings in repose nearly flat.

P. lacertinaria. 1″3 ‴—1″ 5‴. F.-w. ochreous or brown, with 2 slightly waved, brown, transverse lines, between which is a single black spot; an indistinct, slender, pale band towards the hind-margin. V e—VI and VIII.

Larva pale brown and yellowish, varied with spots and clouds of darker brown; two raised tubercles on each of the 3rd and 4th segments, and two others on the 12th segment (*Dup.*) On birch. VI and IX.

Brg. Brs. Ct. Ep. *Ex.* Ha. L.D.! Lw. Ly. M.! Sc.! Sh. St. Tn. Wa.! Wt. Y. Castle Eden Dene; Carlisle. Not an uncommon species.

Genus 3. Drepana.

Imago: antennæ of female ciliated or dentate; fore-wings hooked at the tip, the hind-margin being entire. Wings in repose flat, the hind-wings being then exposed to view.

There are four species, thus distinguished:—

A. Fore-wings with a dark central blotch.
  B. Blotch containing small yellowish spots. *D. sicula.*
  BB. Blotch containing no spots. *D. falcataria.*
AA. Fore-wings without any central blotch.
  C. Fore-wings with two central dark spots. *D. hamula.*
  CC. Fore-wings with one central dark spot. *D. unguicula.*

D. sicula. 1″ 5‴—1″ 7‴. F.-w. brownish ochreous, with 2 wavy, transverse, darker lines, and between them a large central tawny blotch, in which are several small yellowish spots; a black spot in the middle of the second streak, and beyond it a violet patch edged with black: h.-w. paler, with 3 wavy streaks; yellow spots between the 2nd and 3rd, and a black spot on the 3rd. V e.

Larva reddish brown; on the back is a broad pale yellow stripe, with brown spots, most abundant on the 2nd, 3rd and 4th segments; on the 4th segment are two tubercles (*Dup.*) On oak, birch and lime. V—VI.

A specimen taken in Leigh Wood, near Bristol, in May, 1837; a second, in the same locality, in June, 1856.

D. falcataria. 1″ 3‴—1″ 5‴. F.-w. yellowish ochreous, with 3 wavy, transverse, blackish lines; 2 small black spots between the 2nd and 3rd, and a round blue-black blotch on the 3rd; a reddish brown and black line runs from the inner margin to the apex of the wing: h.-w. pale ochreous, with 5 wavy transverse lines. V—VI and VIII?

Larva pale green; a broad dark red-brown stripe on the back; two little tubercles on each of the 2nd, 3rd, 4th, 5th

and 6th segments (*Dup.*) On birch, alder, aspen, willow and oak. V and IX.

Bl. Brg. *Brs. Bu.* Ct.! Ep.! Ha. Hu. L.D. Lw.! Ly. M. Pr. Sc. Sh. St. Tn. Wt.! Y.! Carlisle.

D. HAMULA. 1″—1″ 4‴. Pale ochreous-brown, with 2 paler transverse lines; f.-w., 2 black spots between the lines; h.-w. of ♀ paler. V—VI and VIII.

Larva greyish brown; a broad dorsal stripe, greenish brown on the 2nd, 3rd, 4th, 12th and 13th segments, yellowish brown on the others, edged with yellow on each side; 4th segment with two tubercles on the back (*Dup.*) On oak and birch. VI and IX.

Brg. Brs. Ep.! Lw. St. Lympstone; Carlisle.

D. UNGUICULA. 1″ 1‴—1″ 3‴. F.-w. pale ochreous-brown, with a slight reddish tinge; a broad darker central band, in which is a dark brown spot: h.-w. paler ochreous-brown, with a dark central band. V and VIII.

Larva reddish brown, with a dark brown dorsal stripe from the 6th to 10th segments; the 2nd to 4th segments with a yellow line on each side, meeting on the back of the 5th; one raised tubercle on the 4th segment (*Kleemann*). On beech. VI and IX.

Brs.!! Ep.!! Ha.!! St.! *Tn.* Wa.! Generally abundant where it occurs.

Family XI. PSYCHIDÆ.

Imago: antennæ of male pectinated, of female simple or none; wings of male broad, female entirely wingless.

Larva constructs a moveable case, in which it lives, and in which it changes to a pupa.

Though the males in this Family, especially of the larger

species, have a complete Bombyciform appearance, from the robustness of the short bodies and highly pectinated antennæ, the *wingless* females seem widely remote from the group to which their lords claim affinity; and, as similar wingless females occur among the TINEINA, it is not surprising that many have been disposed to place in one group all the case-bearing moths which have wingless females. The female of *Psyche*, not only without wings, but deprived of legs or antennæ, is so totally opposed to all our ideas of a moth, that it requires some little faith, on first beholding this helpless egg-bag, which never quits the case in which it is bred, to believe that it is really the *perfect* insect of a female BOMBYX. The males fly by day in search of the females. The latter are easily obtained by rearing; and it is probable the cases of this sex are placed in more exposed situations, in order that they may be more readily found by the winged sex, since the collector is far more apt to breed females than males.

The construction of the cases varies much according to the different species. The case most frequently found (that of *Nitidella*) is formed of pieces of grass-stems placed lengthwise, side by side; but the case of the larger species (such as *Nigricans*) is a much more elaborate construction.

The species are all in the larva state in early spring or middle of summer, the perfect insects appearing from one to two months after the larvæ are fed up. *Nitidella* and *Radiella* are the commonest, and the tyro will perhaps meet them his first season. *Fusca* is not frequently met with, and the other species are local, *Nigricans* and *Opacella* haunting the New Forest, whilst *Reticella* frequents the banks of the Thames at Gravesend and Sheerness.

There are two genera, thus distinguished:—

A. Female vermiform, without legs or antennæ. 1. PSYCHE.
AA. Female with legs and antennæ. 2. FUMEA.

Genus 1. PSYCHE.

Imago: antennæ of the male plumose, abdomen rather thick; female wingless, no legs nor antennæ, never emerging from the case.

In this genus we have at present three species, the males of which may be thus distinguished:—

A. Fore-wings with a dark spot beyond the middle. *P. nigricans.*
AA. Fore-wings with no dark spot.
B. Wings pale blackish, with darker margins. *P. opacella.*
BB. Wings dull fuscous. *P. fusca.*

P. NIGRICANS. 1″. Dull blackish; a darker spot at the termination of the discoidal cell; body clothed with dark grey down. VI.

LARVA UNDESCRIBED.

Not uncommon in some seasons in the New Forest, the large cases being very conspicuous.

P. OPACELLA. 9‴—10‴. Wings pale blackish, rather transparent, with darker margins; thorax and abdomen clothed with short blackish down. VII.

LARVA UNDESCRIBED.

Has been taken in the New Forest Not common.

P. FUSCA. 11‴. Semitransparent, dull fuscous. VII.

Larva dull brown; head black, with two white lines; 2nd, 3rd and 4th segments black, prettily marbled with white: case covered with pieces of leaf and grass put crossways round it. On sallow, bramble, &c. VIII—VI.

Darlington. Formerly taken plentifully at Hornsey Wood.

Genus 2. Fumea.

Imago: antennæ of the male pectinated, abdomen slender: female wingless, but with legs and antennæ. When it escapes from the pupa, it emerges from the case, and sits on the outside.

The males of the three species of this genus may be readily distinguished as follows:—

A. Wings without markings.
  B. Wings dull black. *F. radiella.*
  BB. Wings shining brownish black. *F. nitidella.*
AA. Wings whitish, with transverse darker markings. *F. reticella.*

F. radiella. 6‴—7‴. Slightly transparent; dull black. V.
Larva unknown.
Ep. K.!

F. nitidella. 6‴—6½‴. Shining brownish black; h.-w. darker. VII.
Larva reddish or yellow, with a shining chestnut-brown head, and the 2nd, 3rd and 4th segments with spots of the same colour. Case composed of pieces of stem of grass placed parallel to one another (*Ochs.*) On sloe, elm, sallow, &c. V—VI.
Brs.!! Ep. Ha. K. M.!! Pr.! Te.
The commonest species in this genus.

F. reticella. 4½‴. White, with slender, transverse, fuscous bands and streaks, whence it appears reticulated. VI.
Larva unknown.
Has occurred near Sheerness and below Gravesend, among *Plantago maritima.*

Family XII. COCHLIOPODIDÆ.

Imago: antennæ not pectinated, at the most slightly dentated; wings rather short and broad, alike in both sexes, with rather long fringes.

Larva smooth, onisciform, with no perceptible legs.

Pupa enclosed in a firm cocoon amongst leaves.

These singular insects, of which only two occur in Europe, appear removed from all the other Lepidoptera by the structure of the larvæ. These larvæ feed up in the autumn, and the perfect insects appear in June. *L. testudo* is not uncommon, at times, where it occurs; but the perfect insect flies actively by day, and soon tatters itself. *H. asellus* seems almost confined to the New Forest.

There are only two genera, thus distinguished:—

A. Fore-wings unicolorous. 1. HETEROGENEA.
AA. Fore-wings with transverse markings. 2. LIMACODES.

Genus 1. HETEROGENEA.

Imago: fore-wings trigonate, without markings; abdomen slender.

H. ASELLUS. 10‴. Spotless; f.-w. shining yellowish brown; h.-w. dark fuscous. VI e—VII.

Larva greenish, with raised dots, with a broad yellow stripe on the back, inclining to reddish on the side (*Treitschke*). On oak, beech and poplar. VIII—X.

Ly. Wt.

Genus 2. Limacodes.

Imago: fore-wings rather oblong, with transverse markings; abdomen rather stout. The insect might readily be taken for a *Noctua*.

L. testudo. 1″. Yellowish brown or brownish; f.-w. with an oblique transverse line in the middle, followed by an angulated one, the included space being generally darker than the rest of the wing; h.-w. brown, ochreous at the anal angle. VI.

Larva green, with shining raised spots; on the back are two whitish lines, margined with reddish yellow; a yellow lateral line (*Treitschke*). On oak and beech. IX—X.

Brg. *Wt.* West Wickham Wood.

With this species we arrive at the termination of the Bombycina, which, it will be observed, are on many accounts a very unsatisfactory group.

The revolution that has been caused in our cabinets, by rare *Noctuæ* being taken in abundance at sugar, has not extended to this tongue-less group, which cannot be attracted by our sweets; and till larva-collecting and larva-rearing is more extensively practised among the collectors of the larger Lepidoptera we must not be surprised that so many of the Bombycina are scarce in collections.

NOCTUINA.

As it is to this group of insects that the bulk of night-flying moths belong, they are very aptly named after their nocturnal habits.

We have about 300 British species; and to the collector they are are well known by their great predilection for sweets. It is for the NOCTUINA that he spreads sugar on the trunks of trees. Yet in this group we meet with several genera of day-flying species, and others which rarely or never visit the sugared trees.

The group is perhaps best recognised by the moderately stout body and the generally narrow fore-wings, under which the hind-wings are folded in repose; so that the insect then looks much smaller than it does when the wings are all expanded.

I well remember my surprise when I first beheld a *Tryphæna pronuba*, dull reddish brown, inconspicuous thing, as it looked, display its yellow under wings, and grow, as it seemed, to three times its previous size.

Before commencing to describe any of this group it will be well to mention that a certain pattern occurs very constantly in the markings of the fore-wings; thus, near the costa of the fore-wings, about the middle, are two spots, called the stigmata; that nearest the base of the wing is round or oval, and is called the orbicular stigma (*abbreviated* orb. st.); the other is kidney-shaped, and is called the reniform stigma (*abbreviated* ren. st.); beneath the orbicular stigma is frequently a third, of a wedge-shape, called the claviform stigma (clav. st.)

Besides these marks, are four transverse lines; that nearest

the base rarely reaches more than half across the wing, and is named the half-line (h. l.); the next, before the middle of the wing, is the inner line (i. l.); then, beyond the middle, is the elbowed line (el. l.); and beyond follows the subterminal line (subt. l.) Between the inner line and the elbowed line is frequently a less distinct broader line, the central shade (cen. sh.)

The three stigmata may be well seen in *Agrotis exclamationis*, and the first three lines and central shade in *Grammesia trilinea*; but in few species are they totally wanting, though at times much obscured by the shading on the wings.

In the following pages the arrangement adopted will be that of M. Guenée, in his great work on the Noctuelites of the whole world; and those who want further information on the subject are referred to that valuable work.

The Noctuina are divisible into two main groups, Trifidæ and Quadrifidæ.

The Trifidæ, which comprise nineteen-twentieths of the European Noctuæ, are divisible into three sections, Bombyciformes, Genuinæ and Minores.

The Quadrifidæ, of which very few occur in Europe, has four of its sections represented here, Variegatæ, Intrusæ, Limbatæ and Serpentinæ.

Of the Trifidæ the imago is generally of moderate size (sometimes small); the hind-wings usually are much folded under the fore-wings, the inner margins of the latter in repose frequently overlapping; the median vein of the lower wing generally with *three branches*.

The pupa is usually under ground, and the larva generally has sixteen legs, and consequently few loop when walking.

Of the Quadrifidæ the imago has the wings generally broad (sometimes of very large size); the hind-wings are but little folded, and the inner margins of the fore-wings rarely overlap in repose; the median vein of lower wing generally with *four branches*.

The pupa is rarely under ground; the larva rarely has sixteen legs, more frequently fourteen or twelve, almost always looping more or less when walking.

The three sections of the TRIFIDÆ may be thus briefly characterized:—

BOMBYCIFORMES. Imago: the PALPI GENERALLY SHORT; fore-wings rather thick; hind-wings slender. Pupa in a cocoon or among leaves. Larva with sixteen legs, OFTEN HAIRY, solitary or in little families.

GENUINÆ (which includes seven-eighths of the European NOCTUÆ). Imago: PALPI GENERALLY WELL DEVELOPED; fore-wings very thick; hind-wings slender, generally of dull colours. Pupa generally subterranean. Larva with sixteen legs, smooth, solitary.

MINORES. IMAGO OF SMALL SIZE; body generally slender; fore-wings not very thick, triangular; hind-wings well developed, often sharing the colours and markings of the fore-wings. Pupa subterranean, or in a cocoon on the surface of the ground. Larva with TEN or sixteen legs, smooth, solitary.

The section BOMBYCIFORMES comprises three families, and, though very easily separated in the larva state, it is by no means easy to point out good characters for the perfect insects; and to tabulate them seems impossible. The three families are,

1. NOCTUO-BOMBYCIDÆ. 2. BRYOPHILIDÆ. 3. BOMBYCOIDÆ.

Family I. NOCTUO-BOMBYCIDÆ.

Imago of moderate size; body mostly smooth. Larva smooth or with little eminences, living on trees or shrubs quite exposed, or between leaves united by silk.

The insects of this Family come readily to sugar; and, as the two pretty *Thyatiræ* and several species of *Cymatophora*

are common, the young collector may expect to add them to his collection at an early period. *C. flavicornis*, from its early appearance, induces us to sugar the birch-trunks in March.

This Family comprises but two genera, which may be readily distinguished thus:—

A. Fore-wings spotted or streaked with gay colours. Genus 1. Thyatira.

AA. Fore-wings not spotted nor streaked with gay colours. Genus 2. Cymatophora.

Genus 1. Thyatira.

Imago: antennæ rather short, pubescent; abdomen long, rather slender, crested on the first segments; fore-wings oblong, marked with gay colours. Larva not hairy, in *Batis* with little dorsal prominences on several of the segments (thus reminding one of the *Notodontidæ*). In repose the anal prolegs are raised from the surface on which the larva rests. They feed, perfectly exposed, on bramble-leaves.

Our two species, both highly beautiful, are very different in appearance.

T. derasa (Buff Arches). 1″ 5‴—1″ 7‴. F.-w. pale olivaceous grey; an oblique white streak from the costa beyond the middle of the inner margin, and a whitish streak from the apex to the anal angle; the central portion of the wing is much filled up with dull brownish orange, at the hinder edge of which is a series of wavy, indented, brown lines. VII.

Larva dark rich brown, with a conspicuous whitish spot on each side of the 5th, 6th and 7th segments (*Hub.*) On bramble. IX.

Bi.! Brg.! Brs.! Bu.! Ca. Ct. Ex.! Hu. K. L.D. Lw.! Ly.!! M.! Pl.! Sc. Sh. St. Tn. Wt.! Wr. Y.

T. Batis (Peach Blossom). 1″ 5‴—1″ 6‴. F.-w. olivaceous brown, with five pink spots (of the colour of peach-blossom), the largest at the base, the smallest on the inner margin, 1 at the anal angle and 2 beyond the middle of the costa. VI, VII.

Larva reddish grey marbled with brown, with a rather large tubercle on the back of 3rd segment, and a smaller tubercle on the back of each of the 6th to 10th segments (*Hub*). On bramble. IX.

Bi. Brg.! Brs.! Bu.! Ca. Ex.! Ha.! Hu.!! L.D.! Lw.! Ly.!! M.! Pl. Sc. St. Tn. Wt.! Wr. Y.

Genus 2. Cymatophora.

Imago: antennæ rather short, thick, velvety in both sexes; abdomen sometimes slender, not crested; fore-wings moderately broad, with numerous transverse lines, ground-colour greyish or greenish.

Larva smooth, rather flattened beneath; the head large. Feeds on trees, between two leaves united by silk.

A table of the species would take up more space than we could well afford. Our readers are requested to give their attention to the descriptions.

C. duplaris. 1″ 3‴—1″ 4‴. F.-w. pale grey, with numerous wavy darker bands and streaks: two black spots on the disk beyond the middle. VI e—VII.

Larva bluish grey; a row of white dots on each side of the back; sides and belly whitish (*Hub.*) On birch. VIII—IX.

Bi. Brg.!! Bu. Ct. Da.! Ha.! Hu.! L.D. Lw. Ly. Pl.! Sc. St.!! Tn. Wt. Wr. Y.

C. fluctuosa. 1″ 5‴—1″ 6‴. F.-w. whitish, with a very broad dark brownish band in the middle; clouded with

grey towards the hind-margin: a short black dash runs inwards from the costa a LITTLE BEFORE the tip. VI.

Larva yellowish white, with a black-brown head (*Treitschke*). On birch. IX—X.

Ex. Hu. L.D. St. Tn. Wr.

C. DILUTA. 1″ 2‴—1″ 4‴. F.-w. pale grey, with a slight ochreous or rufous tinge; TWO STRAIGHT, SLIGHTLY WAVED, brown bands, 1 before and 1 beyond the middle: h.-w. WHITISH OCHREOUS, with obscure darker central and marginal bands. VIII—IX.

Larva grey, with some minute white dots; a blackish line on each side, below which the sides and belly are whitish; spiracles and row of spots above the legs black (*Hub.*) On oak. VI.

Brg.!! Brs.!! Bu.! Hu.! L.D.!! Lw.! Ly.!! M.!! St. Tn.!! Wa. Wt.! Wr. Y.!!

C. OR. 1″ 5‴—1″ 6‴. F.-w. dull greyish (the stigmata slightly paler), with a broad, slightly curved, dark brown band before the middle; BEYOND THE MIDDLE IS A RATHER OBLIQUE AND MUCH INDENTED, SLENDER, DARK BROWN BAND; a short black streak at the apex: h.-w. dull greyish brown. VI—VII.

Larva pale yellowish green; dorsal line darker; the whitish spiracles placed on a yellowish line (*Gu.*) On poplars. VII—VIII.

Brs. Ca. Ct. Ha. Lw. St.! Tn. Wr. *Y.* Marlow.

C. OCULARIS (Figure of 80). 1″ 4‴—1″ 5‴. F.-w. pale brownish, sometimes with a rosy tinge; with the i. l. and el. l. black, curved and slightly indented; the space between them paler, and THE STIGMATA WHITE, FILLED UP WITH BLACK. VI e—VII b.

Larva very pale yellowish green, with greenish dorsal line and greenish line along the spiracles, which are reddish; a row of black dots above the legs (*Frey.*) On aspen. VIII—IX.

Ca. Ha. Wr.

C. FLAVICORNIS (Yellow-horned). 1″ 6‴—1″ 7‴. F.-w. PALE GREENISH GREY, varied with darker; with 3 transverse, indented, black lines before the middle and 2 beyond the middle: h.-w. GREYISH BROWN, paler towards the base. III.

Larva whitish or dull greenish, with whiter dots, pale brownish between the segments; a row of black dots along the spiracles (*Hub.*) On birch. IX.

Bi. Brg.! Brs.! Hu. Lw. M.!! Sh. Wt. Y.

C. RIDENS. 1″ 5‴—1″ 6‴. F.-w. GREENISH BROWN, with a whitish blotch at the base of the costa, and a slender, whitish, oblique streak before the middle; towards the hind-margin is another slender, whitish, indented streak: h.-w., BASAL HALF WHITISH; hind-margin brown, shading gradually into whitish. IV.

Larva dark bluish grey, with conspicuous whitish dots; dorsal line paler; sides and belly whitish (varies, being sometimes yellowish with several longitudinal green lines, or dull bluish with several longitudinal black lines)—(*Hub.*) On oak. IX.

Brg. Ex. L.D. Lw. Ly. M. St. Wr. *Y.*

Family II. BRYOPHILIDÆ.

Imago of small size; body slender, crested above. Larva smooth, the ordinary spots warty and shining; feeds on lichens, on walls, early in the morning, concealing itself during the day in little nests it forms in the chinks of the wall. (See Shield's 'Practical Hints,' p. 13).

This Family contains but one genus, two species of which are represented here. *Perla* is very common generally, and the young collector may expect to meet it his first season.

Glandifera is more local. The gaily-coloured larvæ are generally in little companies together, and often collected by the uninitiated, who tempt them with every plant they can find for them in the neighbourhood, never dreaming that they feed *on the wall* on which they are found; not that they eat the bricks, only the lichens that grow amongst them.

Genus 1. Bryophila.

We have but two species, readily distinguished by the characters given.

B. PERLA (Marbled Beauty). 11‴—1″ 1‴. F.-w. white or whitish, varied with bluish grey, the dark basal mark being separated from the central grey marks by an UNINTERRUPTED WHITE BAND from the costa to the inner margin. VII—VIII.

Larva bluish black, with a broad orange dorsal stripe; spiracles blackish: head shining black. On lichens. II—IV.

Bi.! Brg.!! Brs.!! Bu.! Ca.! Ct.!! Da.! Ed.!! Ex. Hu.!! Lw.! M.!! Sc. Sh.! St. Tn.! Wt.! Wr. Y.!

B. GLANDIFERA. 1″—1″ 2‴. F.-w. greenish or greenish-grey, varied with darker, the dark basal spot being UNITED with the dark central markings BY A BLACK or dark DASH NEAR THE INNER MARGIN. VII—VIII.

Larva green; a broad dark olive-green dorsal stripe, enclosing a white, interrupted, longitudinal line; head black (*Boisd.*) On lichens. II—IV.

Brg.! Brs.! Ex.! Pl.!! Wr.

Family III. BOMBYCOIDÆ.

Imago of moderate size; body thick and hairy, sometimes crested above. Larva with the ordinary spots warty, and more or less tufted with hair, sometimes very hairy. This is the only Family of NOCTUINA of which the larvæ are so hairy that they might be readily mistaken for BOMBYCINA.

The commonest of this Family is the well-known *Acronycta Psi*, which may be found at rest on trunks of trees and palings, &c., from May to August; and from the middle of August till late in October its polyphagous larva is frequently noticed. *Megacephala* is common on poplars, and *Aceris* among chestnuts and sycamores; and *Rumicis* comes so freely to sweets that the tyro may expect to obtain all the above four his first season. *A. tridens* and *leporina* are not rare in the South, and *Menyanthedis* is common on the northern moors; *Acronycta strigosa* and *Simyra venosa* must be sought for in the fen districts; *A. Ligustri* may be obtained at sugar, or in the larva state amongst young ash trees; *Salicis* comes to sugar in the North of England, and *Myricæ* is common on rocks and at sugar in the North of Scotland. Three species are still rare with us, *Diphtera Orion* and *A. Alni* and *auricoma*, but will probably turn up some day in abundance.

This Family comprises three genera, thus distinguished:—

A. Fore-wings with transverse markings.
  B. Ground-colour of fore-wings green. Genus 1. DIPHTERA.
  BB. Ground-colour of fore-wings pale or dark grey. Genus 2. ACRONYCTA.

AA. Fore-wings with no transverse markings, ochreous, with darker longitudinal streaks. Genus 3. SIMYRA.

Genus 1. DIPHTERA.

Imago: antennæ velvety in the male, simple in the female; abdomen crested on the first segments; fore-wings oblong, green, with distinct black markings.

Larva hairy, reminding one of the larva of *Stilpnotia Salicis*. Feeds on oak, perfectly exposed.

Pupa in a cocoon, not under ground.

We have but one British species.

D. ORION. 1″ 4‴ — 1″ 6‴. F.-w. pale green, with 3 longitudinal white streaks, and with 3 transverse black bands; head pale green; FRONT OF THE COLLAR BLACK, TOP OF THE COLLAR GREEN. VI.

Larva reddish or yellowish grey, with curved silky hairs; back black, interrupted by large oval spots of pale yellow (*Gn.*) On oak. VIII—IX.

Brg. Da. Ly. Tn. Wt.

Genus 2. ACRONYCTA.

Imago: antennæ simple in both sexes; abdomen not crested (except in *Ligustri*); fore-wings oblong or rather elongate, whitish, grey or dark grey.

Larva excessively variable, humped or cylindrical, downy, slightly hairy or very hairy; feeding on trees or shrubs, perfectly exposed.

Pupa in a cocoon amongst moss, or in crevices of bark.

This genus constains thirteen species, which may be thus tabulated:—

A. F.-w. rather uniform in colour, not blotched.

B. A distinct dagger-like mark at anal angle. *A. Tridens* and *A. Psi*.

BB. No distinct dagger-like mark at anal angle.
C. Stigmata and lines indistinct. *A. Leporina.*
CC. Stigmata and lines distinct. *A. Aceris.*
AA. F.-w. with a large dark blotch along the inner margin.
D. The el. l. greyish white. *A. Strigosa.*
DD. The el. l. dark grey. *A. Alni.*
AAA. F.-w. with a conspicuous pale blotch beyond the ren. st.
E. H.-w. whitish. *A. Megacephala.*
EE. H.-w. brownish. *A. Ligustri.*
AAAA. F.-w. with a dark blotch along the hind-margin. *A. Menyanthedis.*
AAAAA. F.-w. with numerous transverse dark markings, but not blotched.
F. The el. l. forms a conspicuous white spot on the inner margin. *A. Rumicis* and *A. Salicis.*
FF. The el. l. forms no conspicuous white spot on the inner margin.
G. H.-w. fuscous. *A. Auricoma.*
GG. H.-w. white. *A. Myricæ.*

A. TRIDENS. 1″ 4‴—1″ 6‴. F.-w. pale grey, varied with darker; with 4 conspicuous black marks, 1 a strong black line from the middle of the base, emitting two or three short branches,—1 near the costa beyond the middle, something like an X,—1 at the anal angle, like the Greek letter ψ,—1 somewhat similar, but less conspicuous towards the apex. VI.

Larva orange-red above, with a small black hump on the 5th segment, and a whitish black-crowned hump on 12th segment (*Sepp.*) On various plants and shrubs. VIII—IX.

Brg.! Brs. Ca. Ex. Ha. Hu. Lw. Sh. St. Wt. Wr. Y.

A. PSI (Common Dagger). 1″ 5‴—1″ 7‴. Resembles the preceding so closely that no specific characters are distinguishable. VI—VIII.

Larva greyish black,

with a broad pale yellow line down the back; a big black hump on 5th seg. (not with a long tuft of hair as in *Cuspis*) and a short black hump on 12th seg. On various plants. VIII—X.

Abundant everywhere.

A. LEPORINA (Miller). 1″ 6‴—1″ 9‴. F.-w. white dusted with grey, with a short black streak from the base, 2 short black streaks from the costa near the middle, and with the blackish el. l. rather distinct; h.-w. white. VI—VII.

Larva pale green, with very long white hairs, looking like carded wool and almost concealing the caterpillar; on the 2nd, 3rd, 4th, 11th and 13th seg. are a few dark hairs. On birch. IX.

Brg. *Brs.* Hu. L.D. Lw. Ly.! M. Pm. Pl. St. Tn. Wt. Y.

A. ACERIS. 1″ 7‴—1″ 9‴. F.-w. pale grey marbled with darker; h.-w. white, some of the veins blackish; thorax PALE grey. VI.

Larva yellowish, with long tufts of orange hair; a lozenge-shaped white spot edged with black on the back of each seg. (*Dup.*) On sycamore and horse-chestnut. VIII—IX.

Brg.! Ca.! Lw.! St. Tn. Wt.

A. MEGACEPHALA. 1″ 7‴—1″ 8‴. F.-w. dark grey marbled with black; a pale blotch near the costa beyond the middle, in the angle of the el. l.; the orb. st. often pale: h.-w. whitish; thorax DARK grey. VI—VII.

Larva yellow grey, dotted with black all along the back; spots raised and reddish; 10th seg. with a large pale blotch. On poplar. VIII.

Common in the southern and midland counties, and apparently not occurring in Scotland.

A. STRIGOSA. 1″ 2‴—1″ 3‴. F.-w. pale grey, shaded with black towards the inner margin; the extreme base of the inner margin is fulvous; the ren. st. pale greyish ochreous, and the el. l. is pale greyish white. VII.

Larva green at sides, with a reddish brown stripe along the back, dotted with black towards the sides and edged with yellowish; a slight eminence on the back of the 5th and 12th seg. (*Hub.*) On sloe. IX.

Cambridge.

A. Alni. 1″ 7‴. F.-w. grey, with a broad blackish blotch extending from the middle of the base along the inner margin, and touching a small blackish blotch on the costa beyond the middle; h.-w. white, tinged with brownish towards the hind-margin. VI.

Larva purplish black, with a transverse yellow spot on the back of the 2nd to 12th seg.; with two long, clubbed, black hairs on each seg. (*Hub.*) On alder, birch, sallow, willow, lime, oak, &c. VII, VIII.

Brg. *Bu.* Ha. Hu. Lw. Ly. M. Pm. *Sh. Wa.* Wr. Y.

A. Ligustri. 1″ 5‴—1″ 6‴. F.-w. greenish brown varied with black, and also with paler markings; the outline of the orb. st. and a large blotch towards the costa near the apex whitish: h.-w. pale brown; thorax WHITISH, MARBLED WITH DARK BROWN. VI, VII.

Larva slightly hairy, green, with white dorsal line and spots, yellow lateral line, and red spiracles (*Hub.*) On ash and privet. VIII.

Brg.! *Brs.* Ca. Ct. Ex. Ha.! L.D. Lw. Ly. M. Pm. Pl. St.! Tn.! Wt. Wr. Y.

A. Rumicis. 1″ 5‴—1″ 7‴. F.-w. brownish grey varied with black, the el. l. terminating on the inner margin in 2 white spots, the subt. l. formed of whitish spots; h.-w. brown, paler towards the base; thorax *pale grey* varied with darker grey. V—VII.

Larva blackish; anterior half of each seg. black above, with a white spot on each side and an orange spot in the middle; a white stripe spotted with red on each side; spiracles white. On various plants. VIII, IX.

Common everywhere.

A. AURICOMA. 1″ 5‴—1″ 7‴. F.-w. rather dark grey, the in. l. and el. l. blackish; a dagger-like streak from the middle of the base, and another intersecting the el. l. near the anal angle; basal edge of inner margin slightly ochreous: h.-w. fuscous or whitish fuscous. VII, VIII.

Larva purplish grey, with the dorsal spots reddish orange; a white stripe along the sides, enclosing the black spiracles, and a row of black dots above them (*Hub.*) On bramble, bilberry, birch, &c. IX.

Brg. Hu. Tn.

A. MENYANTHIDIS. 1″ 4‴—1″ 6‴. F.-w. pale grey clouded with darker, with a black streak from the base, reaching to the in. l.; the 2 stigmata margined with black; the el. l. is curved and indented, and in it towards the anal angle is a ψ-like mark; beyond it the hind-margin is dark grey. VI, VII.

Larva black, with a broad dark red stripe above the feet; dorsal spots black (*Treitschke*). On heather and *Myrica Gale*. IX?

Hu. L.D. M. Sh. St. Y.

A. SALICIS. 1″ 5‴. F.-w. brownish grey varied with black, the el. l. terminating in 2 whitish spots; an irregular row of white spots forms the subt. l.: h.-w. brown, paler towards the base; thorax DARK GREYISH BROWN, with a few paler markings. Closely resembles *Rumicis*, but smaller and darker. VI.

Larva brownish black; a row of blue spots across the middle of each seg.; a crimson stripe above the feet from 3rd to 11th seg. (*Curtis*, fig.) On sallow. VIII.

Hu. M. Halifax, Keighley, &c.

A. MYRICÆ. 1″ 4‴. F.-w. pale grey, varied with dark grey and black, with no conspicuous pale markings; h.-w. white, with the veins faintly brownish. V, VI.

LARVA UNDESCRIBED. On *Myrica Gale*. VIII, IX.

Plentiful at Rannoch.

Genus 3. Simyra.

Imago: antennæ velvety in male, simple in female; abdomen not crested; fore-wings rather pointed, with no appearance of stigmata or lines.

Larva hairy, feeding on low plants.

Pupa in a silken cocoon.

The perfect insect reminds one excessively of *Leucania*, but the hairy larva at once separates it from the Leucanidæ.

We have only one species.

S. venosa. 1″ 4‴—1″ 6‴. F.-w. pale greyish ochreous, dusted with grey, with a slender dark streak along the fold, and sometimes with the hind-margin dotted with black; h.-w. white. VI.

Larva whitish, with blackish dorsal and dark grey lateral stripe; dorsal and lateral spots raised and yellow (*Sepp.*) On *Poa aquatica* and other water plants. IX (*Freyer*).

Ca.! St.

The characters of the section Genuinæ we have already given at p. 172.

This section alone comprises seven-eighths of the European Noctuæ, and nearly four-fifths of the British species.

The Genuinæ are divisible into several families, nine of which are represented here.

As their characters do not admit of their being placed in a tabular form, we must content ourselves here with enumerating the nine families:—

1. Leucanidæ. 2. Apamidæ. 3. Caradrinidæ. 4. Noctuidæ. 5. Orthosidæ. 6. Cosmidæ. 7. Hadenidæ. 8. Xylinidæ. 9. Heliothidæ.

Family I. LEUCANIDÆ.

Imago small or of medium size; the body smooth; forewings of pale colours, rarely with markings.

Larva long, feeding in stems, or merely concealed, but then marked with numerous fine lines.

Pupa either in a subterranean cocoon, or in the stem in which the larva has fed.

Several of this family are very common; and *Leucania pallens*, the Common Wainscot, will surely fall to the lot of the incipient his first summer. In July and August it (and in many places *L. impura*) may be found in gardens at flowers, or at sugar, at lime-blossoms, or the *Glyceria fluitans*. *L. comma* is also, in some places, a common garden insect. *Nonagria Typhæ* occurs commonly in August and September, amongst *Typha latifolia* (a plant very generally called, though improperly, "the bull rush"). Indeed, most of this family are marsh insects; and the still undrained fens, wherever such exist, should be visited by those who wish to find a spot where the species of this family "most do congregate." It is in such haunts that *L. obsoleta*, *pudorina*, *straminea*, *Phragmitidis*, *Meliana flammea*, *Senta ulvæ*, *Nonagria despecta*, *concolor*, *Hellmanni*, *neurica*, *geminipuncta*, *Cannæ* and *crassicornis* occur.

The little *Nonagria fulva* is common in many woods; and it is pleasant, in the dusk of a September evening, whilst a delightful dampness is arising around you, to watch them skimming over the long grass growing by the sides of the pathways with which the wood is intersected. *L. turca* and *lithargyria* come freely to sugar, the former, though local,

being plentiful where it occurs. *L. conigera* is more frequently taken at flowers, and is sometimes observed on the wing by day during bright sunshine.

This Family comprises five genera, of which, however, three consist only of single species. They may be thus separated :—

A. Fore-wings lanceolate. Genus 3. MELIANA.
AA. Fore-wings not lanceolate ; the hind-margin indented. Genus 4. SENTA.
AAA. Fore-wings not lanceolate ; the hind-margin at most truncate. Genus 1. SYNIA. 2. LEUCANIA. And 5. NONAGRIA.

The two last, though excessively similar in the perfect state, are readily distinguished by the habit of the larva, that of *Leucania*, though frequently hiding in stems, being an external feeder, whilst that of *Nonagria* lives entirely within the stems of reeds or grasses feeding on the pith.

Genus 1. SYNIA.

Imago : antennæ of the male pubescent ; abdomen long and smooth ; fore-wings pale, with darker longitudinal streaks.

S. MUSCULOSA. 1″ 3‴. F.-w. pale brownish ochreous, with pale whitish ochreous streaks, 1 along the inner margin, 1 along the fold, 1 along the disk, terminating in the apex. VIII.

LARVA UNKNOWN.

Two specimens have occurred at Brighton.

Genus 2. LEUCANIA.

Imago : antennæ of the male pubescent ; abdomen long and smooth ; fore-wings generally with pale veins, rarely with the lines or stigmata visible, the ren. st. generally reduced to a small central spot.

Larvæ smooth, pale, with fine longitudinal lines; feeding on grasses, and hiding during the day either amongst the tufts of grass or the interior of cut stems, but not eating the pith.

The eleven species of this genus may be thus recognised:—

A. F.-w. with two distinct transverse lines (the i. l. and el. l.)
  B. Both stigmata visible. *L. conigera.*
  BB. Only the ren. st. visible. *L. turca.*
AA. F.-w. with the two lines indicated by rows of dots. *L. lithargyria.*
AAA. F.-w. with only the el. l. indicated by a *row* of dots. *L. obsoleta.*
AAAA. F.-w. with only the el. l. indicated by two dots.
  C. H.-w. dark grey. *L. impura.*
  CC. H.-w. whitish.
    D. Hind-margin of f.-w. dotted with black. *L. straminea.*
    DD. Hind-margin of f.-w. not dotted. *L. pallens.*
AAAAA. F.-w. with no trace of the transverse lines.
    E. F.-w. with no markings. *L. Phragmitidis.*
    EE. F.-w. with paler veins.
      F. F.-w. with a reddish tinge, with no black dash from the base. *L. pudorina.*
      FF. F.-w. with a black dash from the base.
        G. H.-w. white. *L. littoralis.*
        GG. H.-w. grey. *L. comma.*

L. CONIGERA. 1″ 3‴—1″ 5‴. F.-w. reddish ochreous; the i. l. and el. l. dark brown; stig. paler ochreous; the lower end of the ren. st. white. VI, VII.

Larva whitish yellow, with darker dorsal line; a dark brown subdorsal stripe, beneath which is a whitish, a brownish, and then another whitish line (*Hub.*) On some kind of grass. IV?

Brg.! Brs. Ca. Ct.! Da. Ed.!! Ha.! Hu. Lw. M. Pl. Sc.! Wr. Y.!

L. TURCA. 1″ 7‴—1″ 10‴. F.-w. dull dark red, with a

brownish tinge; with the i. and el. lines dark brown; orb. st. invisible; ren. st. like a slender whitish lunule. VI, VII.

Larva yellowish grey, marbled; dorsal line whitish; a series of very obscure dorsal lozenges, paler on each side (*Gu.*) On grasses in woods, principally on *Luzula*. II, III.

A local species. Lw.! Ly.! M.

L. LITHARGYRIA. 1″ 6‴—1″ 7‴. F.-w. reddish ochreous, with a slight greyish tinge; the i. l. and el. l. composed of dark brown dots; orb. st. invisible; ren. st. pale ochreous, its lower end whitish. VII.

Larva whitish, with darker dorsal line, and three rather broad stripes on each side, the middle one darker than the other two (*Treitschke*). On chickweed (*Alsine media*) and plantain (*Plantago*). III?

Common everywhere.

L. OBSOLETA. 1″ 5‴—1″ 6‴. F.-w. pale ochreous dusted with grey, the veins paler; the lower end of the ren. st. forms a whitish spot beyond the middle; the el. l. composed of black dots. VI.

Larva yellowish grey tinged with rosy; dorsal line whitish, edged with dark green; subdorsal line slender and whitish; a pale line along the black spiracles (*Gu.*) On the reed (*Arundo Phragmites*). VIII, IX.

At Hammersmith marshes and elsewhere, among reeds.

L. LITTORALIS. 1″ 4‴—1″ 5‴. F.-w. pale ochreous; a central white streak from the base to the hind-margin, margined on both sides with dark fuscous; h.-w. WHITE. VII.

LARVA UNDESCRIBED.

On sand hills on the coast. Bi.! Brs. and Isle of Wight.

L. PUDORINA. 1″ 5‴—1″ 7‴. F.-w. REDDISH ochreous dusted with grey, with the veins paler, but with no spots; h.-w. greyish, with reddish fringes. VII.

Larva yellowish grey, with whitish dorsal line; with three whitish lines, one black line, and two rows of black dots on each side (*Freyer*). On several grasses. III, IV.

Brg. Ca.!! Sc.! Y.!

L. COMMA. 1″ 4‴—1″ 5‴. F.-w. pale ochreous; veins whitish; between the veins are several black dashes, the most conspicuous runs from the base above the fold: h.-w. greyish, paler at the base. VI, VII.

Larva reddish brown, with three rows of black dots on each side (*Klemann*). On sorrel and various grasses. Autumn and spring.

Bi.! Brg.! Brs.! Bu.! Ca.! Ct. Hu.! Lw. M. Sc.! Sh. Tn.! Wt. Wr. Y.!

L. STRAMINEA. 1″ 3‴—1″ 6‴. F.-w. pale ochreous, with a faint reddish tinge; the veins paler; a darker reddish central stripe from the base to the middle, where there is a small black dot; the el. l. is a row of black dots, of which 2 only are distinct: h.-w. whitish, with a central row of dark spots. VI.

Larva yellowish flesh-colour, with two rows of blackish dots on each side of the dorsal line: on the sides are numerous short fine lines, alternately black and pale flesh-colour (*Gu.*) Feeds on several grasses. II, III, IV.

At Hammersmith marshes.

L. IMPURA. 1″ 4‴—1″ 6‴. F.-w. pale ochreous dusted with grey, the veins paler; 3 conspicuous black dots, 1 nearly in the centre, 2 midway between it and the hind-margin: h.-w. DARK GREY. VI—VIII.

Larva yellowish grey, with a white dorsal line, and white subdorsal line edged above with black (*Hub.*) On species of *Carex*. III, IV, V.

Common everywhere.

L. PALLENS (Common Wainscot). 1″ 3‴—1″ 5‴. F.-w. pale ochreous or reddish ochreous, sometimes slightly dusted with grey; the veins paler; 3 very faint dark dots, 1 nearly in the centre, 2 between it and the hind-margin: h.-w. whitish or very pale grey at the hind-margin, shading into white at the base. VI—VIII.

Larva greyish flesh-colour; two rows of black dots on each side of the dorsal line; subdorsal line above edged with black; beneath this are three stripes, one reddish, one grey and one pale flesh-coloured (*Gu.*) On various grasses. III, IV.

Common everywhere.

L. PHRAGMITIDIS. 1″ 3‴—1″ 4‴. F.-w. pale ochreous, with a slight olive tinge, darker towards the hind.margin, with neither spots nor markings. VII.

Larva dirty white, with a row of large, irregular, violet-brown spots on each side; head and anal seg. shining black (*Treitschke*). In the young stems of the reed (*Arundo Phragmitis*). V.

In the Cambridge fens; also in Greenwich marshes.

Genus 3. MELIANA.

Imago: antennæ pubescent in the male; abdomen very slender, long, smooth; wings thin; fore-wings lanceolate, with neither lines nor stigmata, only with paler veins.

The only species has at first sight considerable resemblance to a *Chilo*.

M. FLAMMEA 1″ 4‴—1″ 5‴. F.-w. pale greyish ochreous towards the costa, separated by a dark streak running, from the base to the apex, from the darker (more fuscous) portion of the wing; the veins paler; el. l. indicated by a row of black dots: h.-w. whitish grey. VI.

LARVA UNKNOWN.

Scarce: occurs in the Cambridgeshire fens.

Genus 4. Senta.

Imago: antennæ pubescent in the male; abdomen very slender, very long, smooth; wings thin; fore-wings oblong, slightly indented at hinder margin; the two stig. distinctly indicated.

Larva elongate, pale, with fine longitudinal lines; feeding on reed.

Pupa enclosed in the reed-stems.

The slender form of this insect also reminds one of *Chilo*, though, from the broader fore-wings, it has less resemblance than the preceding genus.

S. Ulvæ. 1″ 2‴—1″ 3‴. F.-w. greyish, more or less streaked with pale ochreous; the i. l. and el. l. indicated by dots; stig. indicated by their pale ochreous margins; sometimes the stig. are quite black; hind-margin dotted with black: h.-w. whitish; central spot and faint band beyond the middle greyish. VI, VII.

Larva yellowish ochreous, with several fine lines (*Treitschke*). In reed (*Arundo Phragmites*). IX, III, IV.

In the Cambridge fens; also at Hammersmith.

Genus 5. Nonagria.

Imago: antennæ pubescent in the male; abdomen long, smooth, thick in the female: fore-wings rather narrow, of dull colours, sometimes with stigmata, but rarely with visible lines.

Larvæ elongate, uncoloured (like most internal feeders), with very distinct horny plates and shining spots. Feed in the interior of reeds and grasses.

Pupæ enclosed in the stems in which the larvæ have lived.

The nine species we have here may be thus distinguished:—

A. Species small, from 10 to 14 lines in expanse.
  B. F.-w. reddish ochreous.
    C. Body very slender. *N. despecta.*

CC. Body not very slender.
D. H.-w. dark grey. *N. fulva.*
DD. H.-w. whitish. *N. Hellmanni.*
BB. F.-w. whitish ochreous. *N. extrema.*
AA. Species of medium size, from 13 to 19 lines in expanse.
E. F.-w. with two white spots for the ren. st. *N. geminipuncta.*
EE. F.-w. with one black spot surrounded by white. *N. neurica.*
EEE. F.-w. with neither the above markings; tip of f.-w. pointed. *N. Cannæ.*
AAA. Species large, 18 lines to 2 inches in expanse.
F. F.-w. with the i. l. indicated by dots; h.-w. with a black line on hind-margin. *N. Typhæ.*
FF. With neither of the above-named characters. *N. crassicornis.*

N. DESPECTA. 10‴—11‴. F.-w. pale reddish ochreous dusted with grey; the veins dark grey; the I. L. and el. l. indicated by black dots; h.-w. whitish, pale grey towards the hind-margin. VI, VII.
LARVA UNKNOWN.
A marsh species. Ca. !!

N. FULVA. 11‴—1″ 2‴. F.-w. reddish ochreous, more or less dusted with grey; the veins darker and the el. l. indicated by black dots: h.-w. dark grey, whitish towards the base. VIII, IX.
Larva short and thick, dirty white, with reddish dorsal stripe; a blackish line above the black spiracles (*Treitschke*). In the stems of *Poa aquatica* and *Carex*. V, VI.
The commonest of the small species. Bi. Brg.! Brs.! Bu.!! Ca.! Da.! Ed.! K. M.!! Sc.! Y.!

N. CONCOLOR. 1‴—1″ 1‴. F.-w. WHITISH ochreous; the i. l. indicated by a few indistinct dark dots, the el. l. by a

row of distinct dots; hind-margin truncate at the apex: h.-w. grey, some of the veins whitish. VI.

LARVA UNKNOWN.

Has occurred in the fen districts of Cambridgeshire.

N. HELMANNI. 1″—1″ 2‴. F.-w. reddish ochreous dusted and veined with darker; the el. l. forming an indistinct row of blackish dots; hind-margin not truncate at the apex: h.-w. pale grey, whitish grey at the base. VI.

LARVA UNKNOWN.

In the fens round Cambridge.

N. NEURICA. 1″ 1‴—1″ 3‴. F.-w. reddish ochreous streaked with blackish; a broad, blackish, central streak from the base; lower end of ren. st. black surrounded by white; hind-margin dotted with black: h.-w. pale grey, whitish towards the base; hind-margin dotted with black. VII, VIII.

Larva dirty white, with pale red dorsal line (*Treitschke*). In the stem of the reed (*Arundo Phragmites*). IV, V.

Has occurred at Yaxley.

N. GEMINIPUNCTA. 1″ 1‴ — 1″ 4‴. F.-w. brownish ochreous, with a faint olive tint; 2 black dots on the disk before the middle, and 2 small white spots beyond the middle: h.-w. grey. VIII.

Larva dirty white dotted with brownish; head shining brownish red; spiracles black (*Gu.*) In the stems of the reed (*Arundo Phragmites*). V.

In the Cambridgeshire fens, and at Hammersmith.

N. CANNÆ. 1″ 4‴—1″ 7‴. F.-w. reddish ochreous, with a black spot on the disk beyond the middle; the el. l. forms a row of black dots; apex rather acute: h.-w. grey, sometimes greyish ochreous, with a darker central band. VIII.

Larva greenish or yellowish, with the dots black; head brownish; plate of the 2nd and anal segments greenish white; spiracles black (*Treitschke*). On *Typha latifolia*. V.

Has occurred at Yaxley.

N. Typhæ. 1″ 6‴—2″. F.-w. ochreous shaded with brownish; most of the veins paler; the i. l. and el. l. indicated by black dots, the subt. l. by a row of wedge-shaped dots; h.-w. whitish, greyish brown towards the hind-margin; a blackish line on the hind-margin. VIII, IX.

Larva dull flesh-colour; pale dorsal line; head yellowish brown; plate on 2nd segment brownish; anal plate black-brown; spiracles blackish (*Treitschke*). In stems of reed-mace (*Typha latifolia*). V, VI.

Common among the *Typha*. Bi.! Bu.!! Ca.! Hu.!! K.! M.!! Pl.! Wa. Wr. Sc.! Y.!

N. crassicornis. 1″ 8‴—2″. F.-w. ochreous, with a slight reddish tinge, much dusted with blackish; el. l. a row of black dots: h.-w. pale greyish ochreous or whitish, with darker central line, but no dark line on the hind-margin. VIII e—X.

Larva undescribed. In the roots of the reed (*Arundo Phragmites*). VI, VII.

Bi.! *Brg.* Brs. Bu.! Hu. Wr. Sc.! Y.

Family II. APAMIDÆ.

Imago of small or medium size, with the wings of dull colours, in repose roof-shaped; the markings well defined, and the three stigmata generally distinct; abdomen generally smooth, sometimes crested.

Larvæ thick, dull-coloured, generally shining; head small, retractile, living concealed, either at the roots of plants or under the low herbage, or in stems.

This Family embraces a considerable variety of insects. The best-known examples are the Dark Arches (*Xylophasia polyodon*), the Cabbage Moth (*Mamestra Brassicæ*), and *Apamea oculea*, all of which are so abundant during the summer that our most unfledged readers are more likely to wish they did not see so many of them than to wonder where to find

them: they swarm at sugar, come freely to light, and are also to be seen on palings. The following species are all so common that the tyro should make it a point of duty to obtain them before the close of his first season:—*Gortyna flavago*, at light, in September; *Hydræcia nictitans*, at sugar, at light or flying over flowers, in July and August; *H. micacea*, at sugar or flying at dusk, in September; *Axylia putris*, flying at dusk along weedy banks, at the end of June; *Xylophasia rurea* and *lithoxylea*, at sugar or on palings, in June and July; *Heliophobus popularis* comes very freely to light in August; *Cerigo cytherea*, at sugar, in July; *Luperina testacea*, on palings, at sugar or light, in August and September; *Mamestra Persicariæ*, at sugar or on palings, at the end of June; *Apamea basilinea*, at sugar, light, or flying along hedges at dusk, in June; *A. gemina*, at sugar or on palings, in June and July: *Miana strigilis*, at sugar, in June and July; *M. fasciuncula*, flying in meadows at dusk, or at sugar, at the end of June; and *M. furuncula*, flying freely before dusk, at the end of July.

The following species are rare:—*Xylomyges conspicillaris*, *Aporophyla australis*, *Laphygma exigua*, *Heliophobus hispida*, *Pachetra leucophæa*, *Luperina Dumerilii*.

The remainder may be obtained by visiting their especial haunts and localities; and in a few years the collector will find he possesses all but the above six rarities, and perhaps even one or two of them.

This Family comprises eighteen genera, eleven of which contain only single species. Three genera, *Laphygma*, *Miana* and *Celæna*, consist only of species of small size; the remainder are of moderate size, *Xylophasia polyodon* and *Hydræcia Petasitis* being the two largest members of this family

we have. In two genera, *Heliophobus* and *Pachetra*, the males have strongly pectinated antennæ; in *Aporophyla* the antennæ of the male are slightly pectinated, and in *Charæas* and *Luperina* the antennæ of the male are dentate or strongly pubescent; in the other genera the antennæ of the male are either perfectly simple or only slightly pubescent.

Only two species approach a gay colouring: *Gortyna flavago* has dark yellowish fore-wings, and *Cerigo cytherea* has yellowish hind-wings.

In most of the genera the lines and stigmata are tolerably distinct; the subt. l. is frequently much indented in the middle, so as to form a W (as in *X. polyodon*, *M. Brassicæ*, &c.); the ren. st., from its pale colour, is very conspicuous in *Hydræcia nictitans*, *X. scolopacina*, and *M. Persicariæ*, in the latter especially, from the almost black ground-colour of the fore-wings.

The following are the names of the genera included in this Family:—

1. Gortyna. 2. Hydræcia. 3. Axylia. 4. Xylophasia. 5. Dipterygia. 6. Xylomyges. 7. Aporophyla. 8. Laphygma. 9. Neuria. 10. Heliophobus. 11. Charæas. 12. Pachetra. 13. Cerigo. 14. Luperina. 15. Mamestra. 16. Apamea. 17. Miana. 18. Celæna.

Genus 1. Gortyna.

Imago: antennæ crenulated in the male; abdomen long, smooth, very large in the female; fore-wings yellow, with darker markings; the three stig. very distinct.

Larva dull-coloured, with warty spots; feeding in hollow stems of thistles, burdock, &c., and changing to pupa inside the stem.

G. flavago. 1″ 3‴—1″ 7‴. F.-w. dark yellow streaked and shaded with brown; i. l. and el. l. with broad brownish margins; orb. st. pale yellow. VIII, IX.

Larva pale dull yellow, with conspicuous black dots; plate on 2nd seg. grey-brown; anal seg. tinged with greyish brown

(*Sepp.*) In stems of burdock (*Arctium Lappa*), water betony (*Scrophularia aquatica*), thistles, &c. VI.

Bi.!! Brg.! Brs.! Bu.! Ca.! Ct. Da. Ex. Hu.!! K.! M.!! Pl. Sc.!! Sh. Wr. Y.

Genus 2. Hydræcia.

Imago: antennæ crenulated in the male; abdomen sometimes slightly crested at the base; fore-wings rather pointed, the lines distinct, the ren. st. and sometimes the orb. st. distinct.

Larva dull-coloured, with warty spots; feeding in roots of plants.

Pupa in an earthen cocoon.

We have three species, thus distinguished :—

A. The ren. st. conspicuously pale. *H. nictitans.*
AA. The ren. st. not conspicuously pale.
B. F.-w. browh, with no rosy tinge. *H. Petasitis.*
BB. F.-w. pale brown tinged with rosy. *H. micacea.*

H. nictitans. 1″ 2‴—1″ 5‴. F.-w. reddish brown, with darker transverse markings; orb. st. always orange; ren. st. either orange or white. VII, VIII.

Larva dull brown; plate of 2nd seg. darker and shining; a row of brown dots on each side of the dorsal line (*Treitschke*).

On roots of various grasses. V, VI.

Bi.! Brs. Ca. Da. Ed.! Ex. Ha. Hu.! K. L.D.! Ly. M.!! Pl.!! Sc.!! St.! Tn. Wr. Y.

H. Petasitis. 1″ 8‴—1″ 10‴. F.-w. dull brown, with the stig. and a broad ill-defined band towards the hind-margin paler; h.-w. greyish brown, with darker central line. VIII.

Larva dull whitish, with black dots; head, plate of 2nd and plate of anal seg. reddish brown (*Freyer*). In stems and roots of the butter-bur (*Tussilago Petasites*). VI, VII.

Ed. M. !! On the banks of streams where the butter-bur abounds.

H. micacea. 1″ 3‴—1″ 7‴. F.-w. pale brown, with more or less of a rosy tinge; a broad dark patch below the stig. between the i. l. and el. l.; h.-w. whitish grey, with darker central line. VIII—IX.

Larva pale flesh-colour, with a greyish tinge, with black dots; plate of 2nd seg. pale ochreous-yellow (*Freyer*). In the roots of various Cyperaceæ.

Bi. !! Brg. Brs. ! Bu. ! Ca. Da. ! Ed. Ex. Ha. ! Hu. K. M. !! Pl. Sc. !! Sh. Wr. Y. !

Genus 3. Axylia.

Imago: antennæ filiform in both sexes; abdomen short, smooth; fore-wings oblong, with longitudinal markings, the fringe varied.

Larva thick, dull-coloured; the 12th seg. with a slight hump. Feeds on low plants.

Pupa subterranean.

A. putris. 1″ 2‴—1″ 4‴. F.-w. pale ochreous, brown along the costa; stig. with blackish centres; the i. l. very much indented; el. l. a double row of black dots. VI, VII.

Larva brown; dorsal line yellowish, with 1 yellow and 2 white dots on each seg., and a triangular greenish black blotch on the 5th and 6th (*Gu.*) VIII. On low plants.

Bi. ! Brg. Brs. ! Bu. ! Ca. ! Ct. !! Da. ! Ed. ! Ex. ! Ha. ! K. ! L.D ! Lw. M. ! Pl. ! Sc. !! Sh. St. Tn. Wr. Y. !

Genus 4. Xylophasia.

Imago: antennæ long, pubescent in the male; abdomen long, crested; fore-wings long, more or less denticulated.

Larvæ large, shining, of dull colour, with shining warty spots; living concealed beneath stones or at the roots of low plants.

Pupa enclosed in a slight earthen cocoon.

We have six species, which may be thus distinguished:—

A. Subt. l. indistinct.
  B. F.-w. whitish ochreous. *X. lithoxylea.*
  BB. F.-w. reddish ochreous. *X. sublustris.*
  BBB. F.-w. brown or reddish ochreous, with dark brown hind-margin. *X. rurea.*
AA. Subt. l. distinct.
  C. Subt. l. much toothed, with distinct W. *X. polyodon.*
  CC. Subt. l. not toothed, only waved.
    D. Ren. st. ground-colour. *X. hepatica.*
    DD. Ren. st. whitish. *X. scolopacina.*

X. rurea. 1″ 5‴—1″ 7‴. Very variable. F.-w. reddish ochreous, with a more or less whitish tinge; with 3 dark red-brown blotches, 1 at the base of the inner margin, 1 along the costa, and 1 along the hind-margin; sometimes a broad dark brown band occupies the central portion; in other specimens the f.-w. is almost entirely of a uniform red-brown, with only the margins of the ren. st. pale ochreous. VI, VII.

Larva very shining, dark or brownish red; 2nd seg. dark brown, with three fine yellow streaks; dorsal line white edged with brown; a brown lateral streak edged above with red (*Treitschke*). On low plants, *Primula*, *Rumex*, grass, &c. III, IV.

Common everywhere.

X. lithoxylea (Light Arches). 1″ 9‴—1″ 11‴. F.-w. whitish ochreous, brownish between the stig. and hind-margin; the el. l. a row of black dots. VI, VII.

Larva unknown.
Common everywhere.

X. sublustris. 1″ 8‴—1″ 9‴. F.-w. reddish ochreous, with a red-brown blotch between the stig. reaching the fold; el. l. an indistinct row of blackish dots; hind-margin reddish brown. VI, VII.
Larva unknown.
Brg. Brs. Ca. Ct. Lw.! Pl. Sc. St. Y.! Marlow.

X. polyodon (Dark Arches). 1″ 9‴—2″. F.-w. greyish brown, with 4 short black streaks, 2 from the base, 1 (sometimes wanting) between the stig. and 1 below the stig.; subt. l. yellowish grey, its middle forming a distinct W. In dark-coloured specimens the i. l. and el. l. are distinct. VI, VII.
Larva dull livid greyish brown, with conspicuous shining black spots; 2nd and anal seg. black. On roots of several grasses and low plants. IV, V.
Abundant everywhere.

X. hepatica. 1″ 7‴—1″ 8‴. F.-w. pale brownish ochreous, with a reddish tinge; a reddish brown blotch at the base towards the inner margin; a paler blotch between the stig.; hind-margin reddish brown, intersected by the paler subt. l. VI, VII.
Larva dull grey marbled with darker; whitish dorsal line; plate on 2nd seg. reddish brown, with three whitish streaks; anal seg. with a black plate (*Freyer*). On the roots of several low plants. IV, V.
Brg.! Brs.! Bu.! Ca.! Da.! Ex. Ha.! Hu. K.! Lw.! Ly.! M. Pl.! St.! Tn.! Wa.! Wt.! Wr. Y.

X. scolopacina. 1″ 4‴—1″ 5‴. F.-w. whitish ochreous, with a faint reddish tinge; a dark red brown blotch on the inner margin near the base; a paler blotch between the stig.; ren. st. whitish; a reddish brown band along the hind-margin, intersected by the paler subt. l. VII, VIII.
Larva slaty grey, with dorsal and subdorsal lines paler;

lower part of the sides pale sulphur-yellow (*Freyer*). On several rushes, *Scirpus*, *Briza*, &c. V.
Bu. Hu.! M. St. Marlow.

Genus 5. Dipterygia.

Imago: antennæ short, filiform in both sexes; abdomen crested; fore-wings rather dentate at the anal angle; lines and stigmata indistinct; a pale blotch at the anal angle.
Larva elongate, attenuated in front and thickened behind; the 12th segment a little humped. Living concealed among low plants.
Pupa in a cocoon on the surface of the earth.

D. Pinastri. 1″ 4‴—1″ 6‴. F.-w. brown-black; inner margin ochreous-brown; a large ochreous-brown blotch of irregular form towards the anal angle; thorax ochreous-brown, with the sides and front dark brown-black. VI.
Larva rich brown; dorsal line darker; a broad dirty white line along the spiracles (*Gu.*) On *Rumex* in autumn.
K. Lw. *M.* St. Wr.

Genus 6. Xylomyges.

Imago: antennæ pubescent in the male; abdomen crested at the base; fore-wings oblong, subdentate, with longitudinal markings; the lines and stigmata not defined.
Larva of dull colours, attenuated in front; feeding on low plants, concealed during the day.
Pupa subterranean.

X. conspicillaris. 1″ 8‴. Variable. F.-w. dark brown, with pale greyish ochreous inner margin, and transverse bands towards the hind-margin; or f.-w. greyish brown, with 2 conspicuously paler blotches beyond the middle, 1 on the costa and the other on the inner margin, separated by a streak of the darker ground-colour: h.-w. whitish, with greyish brown lunule and hind-margin, and dark brown veins. IV e—V b.

Larva reddish brown marbled with brown and whitish, with a broad paler line along the spiracles, edged above with darker (*Gu.*) On *Lotus* and other low plants. VII.

Wr. Darenth Wood.

Genus 7. Aporophyla.

Imago: antennæ of the male thick, slightly pectinated; abdomen crested at the base; fore-wings oblong, with longitudinal markings, intersected by the lines, which are well-defined.

Larva cylindrical, smooth, with distinct lines; living concealed amongst low plants.

Pupa subterranean.

A. australis. 1″ 5‴. F.-w. grey clouded with darker, especially along the costa, and with several fine blackish longitudinal lines; a strong black line from the middle of the base; the subt. l. is a row of blackish wedge-shaped spots: h.-w., ♂ whitish, ♀ dark greyish brown. VIII, IX.

Larva reddish yellow on the back; dorsal line paler; spiracular line dusted with brown atoms, edged above with black spots (*Gu.*) On various low plants. III.

Brg. Lw. Pl.

Genus 8. Laphygma.

Imago: antennæ slightly pubescent in the male; body slender, slightly crested on the first seg.; fore-wings oblong, narrow; hind-wings white and hyaline.

Larva cylindrical, attenuated anteriorly.

Pupa subterranean.

L. exigua. 1″. F.-w. grey-brown marbled with darker; the orb. st. ochreous, inclining to orange; h.-w. white, with veins and limpid margin brown. VI.

Larva unknown.
Ventnor and Sandown, Isle of Wight. Worthing.

Genus 9. Neuria.

Imago: antennæ pubescent in male, slightly pubescent in female; abdomen slightly stout, rather hairy; fore-wings rather oblong, with pale nervures, lines and spots.
Larva short and thick; living (concealed) on low plants.
Pupa subterranean.

N. Saponariæ. 1″ 6‴—1″ 8‴. F.-w. brown, with the veins, stig. and transverse lines pale ochreous-brown. VI.
Larva reddish grey streaked with brown; the line of the spiracles and the belly whitish; head and plate on the 2nd seg. brown (*Freyer*). On several low plants, particularly on *Silene*. VII, VIII.
Brg. Bu. *Ca.!* Ct.! Ha. Lw. Wt. Y.!

Genus 10. Heliophobus.

Imago: antennæ of male broadly pectinated, of female slightly dentated; abdomen smooth, hairy in male, thick in female; f.-w. thick, with pale nervures; lines and spots distinct; a row of dark wedge-shaped spots before the hind-margin.
Larva thick, attenuated at each end; living concealed at the roots of low plants.
Pupa subterranean.

There are two species, thus separated:—

A. Space between subt. l. and hind-margin of wing dark brown. *H. popularis.*
AA. Same space whitish ochreous. *H. hispida.*

H. popularis (Feathered Gothic). 1″ 7‴ — 1″ 8‴. F.-w. dark brown, with the veins, stig. and subt. l. whitish. VIII.

Larva metallic bronzy brown, darker above, with dirty white lines; the plate on the 2nd and anal seg. shining black (*Gu.*) At the roots of grass. IV, V.

Bi.! Brg. Brs.! Bu. *Ca.!* Ct.! Da. *Ed.* Ex. Ha.! Lw. Ly. M.! Sc. Sh. Tn. Wa. Wr. Y.

H. HISPIDA. 1″ 4‴. F.-w. dark fuscous, with the stig., veins, i. l. and el. l. and straightish subt. l. conspicuously whitish ochreous; outer margin of ren. st. almost straight. IX.

Larva grey dotted with black; the dorsal and subdorsal lines more distinctly dotted (*Dup.*) On lettuce, plantain, &c., under stones. XI.

Plymouth and the Isle of Portland; also at Exmouth.

Genus 11. CHARÆAS.

Imago: antennæ of male pubescent; abdomen not crested, slightly hairy; fore-wings short, thick, rather hairy, with a forked pale spot at the end of the discoidal cell.

Larva smooth, dull-coloured, with distinct lines; the plates of 2nd and anal seg. horny. Living concealed at roots of grasses.

Pupa subterranean.

C. GRAMINIS. 1″ 2‴—1″ 6‴. F.-w. brown, with a central vein whitish, conspicuously so just beyond the middle, where it branches; 3 stig. ochreous-grey; the subt. l. is a row of blackish wedge-shaped spots. VII e, VIII, IX b.

Larva brown or blackish, with the dorsal and spiracular lines yellowish; head and plates of 2nd and anal seg. blackish (*Gu.*) On the roots of various grasses.

Brg. Brs. Bu. Da.! Ed.! Hu. L.D. Lw. M.! Pl. Sh. Sc.! St. Wr. Y.

Genus 12. Pachetra.

Imago: antennæ of male strongly pectinated; abdomen crested in both sexes; fore-wings subdentate, thick and hairy, with very distinct lines and spots; hind-wings slightly hyaline.

Larva thick velvety, larger posteriorly; living concealed amongst grass.

Pupa in a cocoon amongst moss.

P. leucophæa. 1″ 7‴—1″ 8‴. F.-w. greyish ochreous shaded with fuscous; stig. conspicuously paler, margined with whitish; the tooth-like marks before the indistinct subt. l. blackish. VI e.

Larva greyish yellow; dorsal line of a nankeen-yellow; subdorsal line indistinct; head and plate of 2nd seg. pale shining brown (*Gu.*) In tufts of grass growing in woods. X—IV.

Mickleham: a few have occurred at sugar on the downs.

Genus 13. Cerigo.

Imago: antennæ pubescent in male; abdomen long, smooth, with a tuft of hair in both sexes; fore-wings thick, with long fringes; the spots distinct.

Larva elongate, dull-coloured, with longitudinal streaks; feeding on grass, scarcely concealed during the day.

Pupa subterranean.

C. cytherea. 1″ 6‴—1″ 9‴. F.-w. dull grey-brown, with the i. l. and el. l. whitish; h.-w. dull yellowish, with a broad blackish grey hind-margin. VII, VIII.

Larva greyish yellow, with first three seg. and the sides brownish; the lines black (*Gu.*) On grasses growing on dry and stony hills. IX—IV.

Bi. Brg.! Brs. Bu. Ca.! Ct.! Da. Ha.! K.! L.D.! Lw. Ly.!! M. St. Wa. Wt. Wr. Y.

Genus 14. Luperina.

Imago: antennæ pubescent in male; abdomen smooth, thick in female; fore-wings slightly dentate, with lines and spots distinct.

Larva thick, dull-coloured; spots rather distinct. Living inside the stems or amongst the roots of low plants.

Pupa enclosed in an earthen cocoon.

There are three species, thus distinguished:—

A. Fore-wings brownish ochreous.
  B. A black dash below the stig. *L. testacea.*
  BB. No black dash below the stig. *L. Dumerilii.*
AA. Fore-wings dull brown. *L. cespitis.*

L. testacea. 1″ 4‴—1″ 6‴. F.-w. greyish ochreous tinged with brown, generally with 3 blackish streaks, 1 at the base, 1 on the inner margin, and 1 below the stig.; between the el. l. and subt. l. is a paler band: h.-w. white. VIII, IX.

Larva dull flesh-colour; head and plate on the 2nd seg. pale yellowish brown (*Treitschke*). On the lower part of the stems of grass. III.

Bi.!! Brg.!! Brs.! Bu.! Da. Ed.!! Ex.! Ha. Hu. K. Lw.! M.! Pl.!! Sc.! Sh.! Wa.! Wr. Y.!

L. Dumerilii. 1″ 2‴. F.-w. ochreous varied with brown; a brown patch towards the inner margin between the i. l. and el. l., and a brown band before the hind-margin, the band preceding which is conspicuously pale, and the stig. are also pale ochreous. VIII.

Larva unknown.

One specimen only has occurred in the Isle of Arran.

L. cespitis. 1″ 5‴—1″ 6‴. F.-w. dull brown; the stig. margined with pale ochreous; i. l. and el. l. black; subt. l. whitish and sometimes very indistinct: h.-w. white, with brownish hind-margin and dark brown central line. VIII, IX.

Larva brown, with the lines pinkish white; head yellowish brown; 2nd and anal seg. blackish (*Freyer*). On various species of grass. VI.

Bi. Brg. Lw. M. Wt. Y.

Genus 15. Mamestra.

Imago: antennæ rather long, simple in male; abdomen rather long, crested, at least on the first segment; fore-wings entire or slightly dentate, of dark colours, with distinct lines and spots.

Larva elongate, dull-coloured; feeding on leaves of low plants, concealed during the day.

Pupa subterranean, in an earthen cocoon.

We have six species, thus distinguished:—

A. F.-w. ochreous-brown. *M. anceps.*
AA. F.-w. blackish; ren. st. white. *M. Persicariæ.*
AAA. F.-w. dark grey or dark brownish.
  B. Two white dots at edge of ren. st.; subt. l. very indistinct. *M. abjecta.*
  BB. Ren. st. margined with white or whitish; subt. l. rather distinct.
    C. Ren. st. filled up with dark. *M. furva.*
    CC. Ren. st. ochreous-grey, lower half darker. *M. albicolon.*
    CCC. Ren. st. whitish, with a few black scales. *M. Brassicæ.*

M. albicolon may be further distinguished by the subt. l. being formed of yellowish white dots.

M. abjecta. 1″ 8‴—1″ 9‴. F.-w. dark greyish brown; the el. l. and subt. l. slightly paler; hind-margin of the ren. st. appears as 2 white dots: h.-w. rather dark grey, shading into whitish at the base. VII.

Larva unknown.

C. Lw. Y.; also near Gravesend.

M. ANCEPS. 1″ 7‴—1″ 8‴. F.-w. ochreous varied with pale brownish; the margins of the ren. st. almost whitish: h.-w. pale greyish ochreous, with a darker band along the hind-margin, and darker central line and lunule. VI.

Larva pale brown, with three faintly darker streaks; the spots black; 2nd and anal seg. black (*Bork.*) XII—II. FOOD UNKNOWN.

Bi. Brg.! Brs.! Bu.! Ca.! Ct.! Ed. Ha.! Hu. Lw. M. St. Wa.! Wt. Wr. Y.!

M. ALBICOLON. 1″ 7‴. F.-w. grey clouded with dark brownish grey, with a row of yellowish white dots forming the subt. l.; margin of ren. st. white. V e—VI b.

Larva grey-brown marbled with darker; spiracular line pale yellowish; spiracles white, encircled with black (*Sepp.*) FOOD UNKNOWN. VII, VIII.

Bi.!! L.D. St.

M. FURVA. 1″ 4‴—1″ 6‴. F.-w. dull dark brownish; i. l. and el. l. blackish; subt. l. whitish ochreous; margins of ren. st. whitish. VII, VIII.

Larva shining, transparent, of a pale violet-brown, with all the spots, the head, and the plates of the 2nd and anal seg. shining black (*Freyer*) On *Aira canescens*. III—VI.

Ed.!! Ex. L.D. Sc. St.

M. BRASSICÆ. 1″ 8‴—1″ 9‴. F.-w. dark grey varied with black; ren. st. margined and almost filled up with white; subt. l. much indented and whitish. V e—VII.

Larva dark grey, greyish or green, with darker dorsal and whiter spiracular line; the subdorsal line rarely distinct, sometimes whitish; spiracles white. On cabbages and other plants. IX.

Abundant everywhere.

The larva of this species is at times very destructive, feeding in the hearts of the cabbages. Not unfrequently it gets boiled, and is sent to table.

M. Persicariæ. 1″ 6‴—1″ 8‴. F.-w. blackish, with a purplish gloss: ren. st. conspicuously white; subt. l. indicated by yellowish dots: h.-w. dark grey, shading into whitish at the base, with a dark grey lunule. VI, VII.

Larva pale green or reddish grey, with whitish dorsal line, and semi-lozenge-shaped darker marks along the back from the 5th to the 12th seg.; spiracular line paler; 12th seg. with a slight hump. On various low plants. VIII, IX.

Brg. Bu. Ca.! K.! Lw. Ly. M. Pl. St.! Tn. Wa.!! Wt. Wr.

Genus 16. Apamea.

Imago: antennæ pubescent in male; abdomen long, crested; fore wings slightly dentate, with distinct spots; ren. st. generally margined with white.

Larva short, attenuated at each end; skin tough and shining, with distinct lines; spots often shining. Living principally on grasses, concealing itself often in the stem.

Pupa subterranean.

There are seven British species, thus distinguished:—

A. F.-w. with one central very strong black streak from the base. *A. basilinea.*

AA. F.-w. with two black streaks from the base, one central and one on the inner margin.

B. F.-w. pale bluish grey. *A. connexa.*

BB. F.-w. brownish.

C. Hind-margin of ren. st. conspicuously whitish. *A. unanimis.*

CC. Hind-margin of ren. st. not conspicuously whitish. *A. gemina.*

AAA F.-w. with no black streaks from base.
D. Veins adjoining ren. st. whitish. *A. fibrosa.*
DD. Veins adjoining ren. st. not whitish.
E. Thorax pale, with a brown line in front. *A. ophiogramma.*
EE. Thorax dark, with no line in front. *A. oculea.*

A. BASILINEA. 1″ 4‴—1″ 6‴. F.-w. greyish ochreous, with a faint brownish tinge; A SHORT BLACK STREAK FROM THE CENTRE OF THE BASE; margins of ren. st. whitish, its lower half filled up with blackish. VI.

Larva brownish, with the dorsal and subdorsal lines ochreous, and a row of black dots between them; spiracular line and belly whitish; spiracles black (*Hub.*) On grains of wheat, VIII, IX; and on various low plants, II, III.

Common everywhere.

A. CONNEXA. 1″ 3‴—1″ 4‴. F.-w. pale bluish grey; 2 short black streaks at the base; a brownish blotch between the stig. and a very conspicuous dark brown-black blotch on the middle of the inner margin between the whitish i. l. and el. l. VI, VII.

LARVA UNKNOWN.

Hu. Sc. Sheffield.

A. GEMINA. 1″ 5‴—1″ 7‴. F.-w. pale brownish, with 2 short black streaks from the base, and 1 between the i. l. and el. l. beneath the stig; the hind-margin is rather narrowly dark brown, the transverse lines appear a little paler than the ground-colour, and the margins of the ren. st. are sometimes whitish. Very variable in intensity of colour. VI, VII.

Larva dark grey, with whitish dorsal and subdorsal lines, and a row of black dots between them; spiracular line ochreous; spiracles black, with a row of black spots above them (*Freyer*). On grass. IX, X, IV, V.

Common everywhere.

A. UNANIMIS. 1″ 3‴—1″ 4‴. F.-w. pale brown varied with dark brown, with 2 blackish streaks from the base; the

margins of the ren. st. whitish, its hind-margin conspicuously so. VII, VIII.

Larva dull grey; white dorsal line; a row of black dots between it and the whitish subdorsal line; spiracular line whitish (*Freyer*). On grass. IX, X, III, IV.

Bi. Brg. Brs. Ca. Ct. Da.! Ed. Ha.! K. Lw. M. St. Tn.! Y.

A. OPHIOGRAMMA. 1″ 3‴—1″ 4‴. F.-w. dark brown along the costa; inner margin broadly pale greyish-ochreous, the brown portion margined with whitish, projecting deeply into it in the middle; a dark brown dash near the anal angle; thorax greyish ochreous, paler in front, with a dark brown line along the top of the front. VI.

LARVA UNKNOWN.

In all the marshes around London, amongst willows.

A. FIBROSA. 1″ 5‴—1″ 6‴. F.-w. pale brown, with the inner margin and a broad fascia towards the hind-margin whitish brown; ren. st. whitish, and the veins immediately adjoining the lower end of it generally of the same colour; hind-margin dark brown. VII, VIII.

Larva whitish; dull reddish brown along the back; 2nd seg. black (*Treitschke*). In flower-stems of *Iris Pseudacorus*. IV, V.

Ca. Ed. Sc.!! Y.!

A. OCULEA. 1″ 1‴—1″ 3‴. Very variable in colour and markings. F.-w. pale brown, brown, red-brown or black-brown, sometimes darker towards the costa, sometimes with a broad medial band, often with a broad pale band before the hind-margin; ren. st. generally conspicuous, sometimes white, often whitish or ochreous; thorax brown or dark brown, without a dark conspicuous line on the front. VII, VIII.

Larva dull grey or greenish white; subdorsal and spiracular lines dull reddish (*Treitschke*). On various grasses. IV, V.

Abundant everywhere.

This is one of the most abundant of our *Noctuina*.

Genus 17. Miana.

Imago of small size; antennæ short, thick, pubescent in male; abdomen rather slender, crested; fore-wings oblong, thick, generally elbowed at anal angle; lines and spots distinct; ren. st. concolorous.

Larva smooth, attenuated at each end, shining; feeding inside stems or on leaves of grasses.

Pupa contained in an earthen cocoon.

We have six species, thus separated:—

A. Hind-margin elbowed.
  B. Inner edge of pale band beyond the middle curved.
    C. F.-w. blackish brown. *M. strigilis.*
    CC. F.-w. reddish ochreous. *M. fasciuncula.*
  BB. Inner edge of pale band beyond the middle straight.
    D. F.-w. rosy grey. *M. literosa.*
    DD. F.-w. brown. *M. furuncula.*
  BBB. No pale band; f.-w. pale ochreous. *M. arcuosa.*
AA. Hind-margin not elbowed. *M. expolita.*

This last is the smallest species of the genus.

M. strigilis. 1″—1″ 1‴. F.-w. blackish brown; before the hind-margin is frequently a broad pale band, which is sometimes whitish or grey, at other times slightly rosy; a strong black dash between the pale i. l. and el. l. beneath the stig. VI, VII.

Larva greyish or pale greenish; belly and lines paler; spiracles black (*Gu.*) In stems of grasses. III, IV.

Abundant everywhere.

M. fasciuncula. 10‴—1″. F.-w. reddish ochreous more or less mixed with grey, a broad central band being darkest; before the hind-margin is a pale curved band; the lower end of the el. l. is whitish. VI, VII.

Larva unknown.

Bi.!! Brg. Brs.! Bu.! Ca.! Ct.! Da. Ed.! Ha.! Hu. K.! L.D.! Lw. M.!! Sc.!! Sh.! St.! Wa.! Wr. Y.!

M. LITEROSA. 1″—1″ 1‴. F.-w. pale grey varied with dark grey, delicately tinged with rosy; a broad pale band beyond the middle, the inner edge of which is straight. VI, VII.

LARVA UNKNOWN.

Bi.!! Brg. Ca.! Da.! Ed.! Ex.! Hu. L.D.! Lw. M.!! Sc.!! St.! Tn. Y.

M. FURUNCULA. 10‴—1″ 1‴. F.-w. pale or dark brown, with a broad whitish band beyond the middle, the inner edge of which is straight. VII.

LARVA UNKNOWN.

Abundant everywhere.

M. EXPOLITA. 8‴—9‴. F.-w. shining, greyish brown, with more or less of a reddish tinge, with a darker central band; the whitish lower half of the el. l. forming the inner edge of a pale not sharply defined band before the hind-margin: h.-w. dark grey, with whitish fringes. VII.

LARVA UNKNOWN.

Darlington.

M. ARCUOSA. 10‴—1″ 2‴. F.-w. ochreous; i. l. and el. l. indicated by black dots; hind-margin slightly darker; ♀ with the f.-w. paler and the markings darker: h.-w. of the ♂ pale grey, whitish towards the base; of the ♀ grey. VII.

LARVA UNDESCRIBED. In the stems of *Aira caspitosa*.

Bi. Brs. Bu. Ct.! Ed.!! Ex. K.! Ly. M.!! Sh. Wa.! Wt. Wr. Y.

Genus 18. CELÆNA.

Imago: antennæ pubescent in male; abdomen slightly hairy, not crested; fore-wings oblong, rounded; ren. st. always distinct.

LARVA UNDESCRIBED.

C. Haworthii. 1″—1″ 1‴. F.-w. reddish brown, with broad darker central band, in which the ren. st. is conspicuously whitish, this colour also extending to the veins immediately below the lower end of it; the central and subdorsal veins generally entirely whitish; a slender, pale, rather oblique band before the hind-margin. VII—IX.

Larva undescribed. On cotton-grass (*Eriophorum*). V, VI.

Common on heaths in the North. Da. Ed.! M. Sc.!! Y.!

Family III. CARADRINIDÆ.

Imago rather of small size; the body smooth; fore-wings (roof-shaped in repose) rather oblong, with the lines and sometimes with the stigmata well marked.

Larva short and thick, with short stiff hairs; feeding on low plants.

Pupa in a subterranean cocoon.

This Family comprises but seven British species, two only of which, *Hydrilla palustris* and *Acosmetia caliginosa*, are rare. *Grammesia trilinea*, which comes freely to sugar in June, or may be taken flying in meadows, in company with *Hepialus Humuli*, is one of our most abundant *Noctuæ*. *Caradrina cubicularis* is also a most plentiful insect, and, from its paler under wings, is very conspicuous when flying at dusk along a hedge: it comes freely to light, and is frequently found in stables. The other three *Caradrinæ* are by no means rare, but, as obscure dingy things, are likely to be neglected by the tyro.

The four genera comprised in this Family may be recognised by the markings of the fore-wings, thus:—

A. F.-w. with three lines; no stigmata. Genus 1. Grammesia.

AA. F.-w. with two lines and the ren. st.

B. Female much smaller than male, with narrower wings. Genus 2. Hydrilla.

BB. Female but little smaller than male; wings of similar form. Genus 3. Acosmetia.

AAA. F.-w. with the four lines (more or less distinct) and both the stigmata. Genus 4. Caradrina.

Genus 1. Grammesia.

Imago: antennæ rather long, pubescent in the male; fore-wings with no stigmata; the three first lines well indicated; THE EL. L. ALMOST STRAIGHT.

Larva short and thick, almost onisciform; the head small; very sluggish. Concealed amongst the leaves of the low plants on which it feeds.

Pupa subterranean.

G. TRILINEA. 1″ 6‴—1″ 7‴. F.-w. greyish ochreous, with the h. l., i. l. and el. l., and cen. sh. brownish. V e—VII.

Larva reddish brown; dorsal line whitish, with two rows of black dots on each side; subdorsal and spiracular lines dark brown (*Freyer*). On plantain. IV, V.

Bi.! Brg.!! Brs.! Bu.! Ca.! Ct.! Ex. Ha.! Hu.! K.! Lw. Ly.! M.!! Sc.!! Sh.! St. Tn.! Wa. Wt.! Wr. Y.!

A dark variety, in which the cen. sh. is almost lost in the darker ground-colour (*Bilinea*), occurs at Epping and Lewes.

Genus 2. Hydrilla.

Imago: antennæ short, pubescent in the male; abdomen slender (rather long in the male); fore-wings oblong, with scattered scales, appearing hairy. The female very different from the male, smaller, with the fore-wings very narrow.

Larva thick, attenuated at each end; living concealed amongst the low plants on which it feeds.

Pupa subterranean.

H. PALUSTRIS. 1″ 1‴—1″ 2‴. F.-w. dull brownish, with the ren. st. blackish; the i. l. and el. l. dark brown: h.-w. pale greyish brown, with darker central lunule. V e—VI b.

Larva brownish; head black; dorsal line whitish, with two rows of white dots on each side; spiracles black (*Treitschke*). On plantain and other low plants. VII, VIII.

One specimen at Compton's Wood, near York; flying over grass in a damp place.

Genus 3. ACOSMETIA.

Imago: antennæ short, pubescent in the male; abdomen very slender; fore-wings broad, shining, with a silky appearance. Female similar in form, only a little smaller.

LARVA UNKNOWN.

A. CALIGINOSA. 1″. F.-w. shining greyish brown, with very faint indications of a darker ren. st. and the i. l., el. l. and subt. l.; it appears almost unicolorous: h.-w. dull greyish white. VI.

LARVA UNKNOWN.

New Forest. It flies at dusk or during the day in moist places in woods.

Genus 4. CARADRINA.

Imago: antennæ rather short, filiform; abdomen not especially slender, but less robust than in *Grammesia;* fore-wings thick, silky, with distinct lines and stigmata; hind-wings slender and often iridescent.

Larva short, attenuated at each end; the head very small; sluggish; feeding on low plants, concealed during the day.

Pupa subterranean.

We have four species, two of which, *Alsines* and *Blanda*, are very similar, and have long been confounded in collections. The perfect insects, unless in fine condition, are not easy to determine; the larvæ afford a constant character.

The other species may be distinguished by the colour of the hind-wings, thus:—

A. Hind-wings whitish or whitish ochreous at the base, darker beyond the middle. *C. Alsines* and *blanda.*
AA. Hind-wings dull white. *C. Morpheus.*
AAA. Hind-wings pearly white. *C. cubicularis.*

C. Morpheus. 1″ 3‴—1″ 4‴. F.-w. grey or greyish ochreous; the lines and stig. darker, the ren. st. conspicuously so: h.-w. dull white, tinged with grey towards the hind-margin, and with grey central lunule. VI—VIII.

Larva greyish brown, with a row of wedge-shaped black streaks on each side of the back; spiracular line paler (*Sepp.*) On teazle and other plants. IX—IV.

Bi.! Brg.! Brs. Bu.! Ca.!! Ed. Ex. Lw. M. Sc.! Sh. St. Wa.! Wt. Wr. Y.!

C. Alsines. 1″ 2‴—1″ 3‴. F.-w. pale brown, with a slight reddish tinge; the stig. DARKER BROWN, margined with yellowish; the lines and cen. sh. DISTINCTLY DARKER brown; h.-w. whitish ochreous, with darker hind-margin. VII.

Larva greyish, with lateral streaks; subdorsal line pale, bordered above by a fine line PARALLEL to it; spiracular line broad, pale, with some blackish oblique spots above it (*Gu.*) On dock, chickweed, plantain, &c. III, IV.

Probably in most of the localities of the following, with which it has hitherto been confounded.

C. blanda. 1″ 2‴—1″ 3‴. F.-w. brown, WITH A FAINT VIOLET TINGE, DUSTED WITH WHITE TOWARDS THE COSTA; stig. HARDLY darker than the ground-colour, edged with yellowish; the lines and cen. sh. darker, but NOT strikingly so: h.-w.

whitish at the base, with brownish grey hind-margin and veins. VI, VII.

Larva similar to that of *C. alsines*, except that the fine line above the subdorsal line is OBLIQUE (*Gu.*) On various low plants.

Bi.! Brg.! Brs. Ca.! Ct.!! Da.! Ed. Ex.!! Ha.!! K. Lw. M. Sc.!! Tn.! Wa.! Wt. Y.!

C. CUBICULARIS. 1″—1″ 3‴. F.-w. greyish ochreous, with faint indications of the lines darker, the first two, as spots on the costa, almost black; the orb. st. small and rather indistinct; the ren. st. large and conspicuous, dark grey: h.-w. pearly white; a dark brown line on the hind-margin. VI—VIII.

Larva: back reddish grey; sides dark grey; head shining black (*Treitschke*). On chickweed (*Alsine media*). IX—IV.

Common everywhere.

Family IV. NOCTUIDÆ.

Imago of moderate size; antennæ ciliated, pectinated or only pubescent in the male; fore-wings smooth or shining, narrow, crossing one another a little in repose, which give the insect a very elongate appearance, forming a roof almost flat.

Larvæ thick, smooth, shining or velvety, generally of dull colours; living on low plants, and concealing themselves either under leaves on the ground or even in subterranean galleries.

Pupa subterranean, smooth and shining, enclosed in an earthen cocoon.

This Family contains several of our best-known *Noctuæ*; the Yellow Underwing (*Triphæna pronuba*), which we so often start in strawberry beds and hay fields; the white underwinged *Agrotis segetum* and *exclamationis*, which haunt our flower beds at dusk on a summer's evening; the heath-loving *A. porphyrea*; and that abundant wayside pest in August and

September, *Noctua xanthographa*. These insects can hardly have escaped the notice of the least observant. Several others of the Family are also sufficiently common for the tyro to expect to fall in with them his first season, such as *Rusina tenebrosa*, at sugar, in June; *Agrotis puta*, at sugar, in August; *A. suffusa*, in September; *A. nigricans*, in July; *Triphæna Ianthina* and *interjecta*, at sugar or flying along hedges before dusk, in July and August; *T. orbona*, abundantly at sugar; and *T. fimbria*, so little a rarity now-a-days that it ought to fall into the hands of the tyro at least in his second season. Of the genus *Noctua* the following are all common, and may be taken at sugar, light, or flying along hedges at dusk, viz., *Augur*, *Plecta*, *C-nigrum*, *Festiva*, *Bella*, *Umbrosa* (the two last partial to the flowers of the *Glyceria fluitans*), *Baja*, besides *Xanthographa*, already mentioned. Several of this Family are local; thus, *Agrotis valligera*, *ripæ* and *cursoria* are to be found on sand hills on the coast; *lunigera* is to be met with in the Isle of Wight, and *Ashworthii* in North Wales; *cinerea* is most frequently found about Lewes, *Noctua depuncta* in the neighbourhood of Carlisle, *sobrina* in Perthshire, and *subrosea* in the fens of Huntingdonshire; *Triphæna subsequa* in the New Forest and Sherwood Forest. Then, wherever there is any extent of heather, *Agrotis agathina* and *Noctua glareosa* and *neglecta* may be expected. *A. lucernea* has the peculiarity of flying briskly by day over loose stones (where it is no easy matter to chase it) on the slopes of mountains, and abounds at Arthur's Seat, Swansea, &c. *Agrotis fennica* is unique; *saucia*, though taken almost every autumn at ivy-bloom, is considered rare; *pyrophila*, a northern

species, still remains rather rare; and *Noctua ditrapezium* is yet to be counted as a rarity; its head-quarters, or its habits, not being sufficiently known.

This Family comprises only four British genera, which may be thus distinguished:—

A. Hind-wings dark grey, with the fringes darker. Genus 1. Rusina.
AA. Hind-wings yellow or orange. Genus 3. Triphæna.
AAA. Hind-wings whitish or grey, with paler fringes.
B. Fore-wings rather elongate; the clav. st. generally well marked. Genus 2. Agrotis.
BB. Fore-wings moderately oblong; the clav. st. rarely visible. Genus 4. Noctua.

Genus 1. Rusina.

Imago: antennæ of the male strongly pectinated; abdomen rather slender, not crested; fore-wings dull-coloured; HIND-WINGS DARK GREY, WITH THE FRINGES DARKER.

Larva velvety, slightly attenuated at each end; feeding on low plants through the winter.

Pupa enclosed in an earthen cocoon but little below the surface of the earth.

R. TENEBROSA. 1″ 3‴—1″ 4‴. F.-w. dull smoky brown, with the lines blackish; cen. sh. dark brown; 5 or 6 ochreous dots on the costa, and outer edge of ren. st. tinged with ochreous. VI, VII.

Larva rich brown; subdorsal line composed of oblique black streaks, and bordered above posteriorly with pale brown; dorsal line dark brown, on the first 5 segments having a slender white line down the middle; spiracular line pale brown. On *Polygonum aviculare* and other low plants. IX—III.

Bi. Brg.!! Brs. Bu. Da. Ed. Ex. Hu. K. Lw.! Ly.! M.! St.!! Tn.! Wt.! Y.!

Genus 2. Agrotis.

Imago: antennæ pubescent, ciliated or pectinated in the male; abdomen not crested; fore-wings rather elongate, with distinct lines and spots; THE CLAV. ST. ALMOST ALWAYS DISTINCT; hind-wings WHITISH or pale grey, with the fringes PALER.

Larva thick, with distinct horny plates, sometimes with the spots shining and warty, sometimes quite smooth and the spots concolorous; living concealed amongst the roots of low plants.

Pupa subterranean.

Of this genus we have no less than twenty-three species, the first seventeen of which may be thus tabulated:—

A. F.-w. with the i. l. excessively angulated. *A. valligera.*
AA. F.-w. with the i. l. not excessively angulated.
  B. The orb. st. almost linear. *A. puta.*
  BB. The orb. st. oval or round.
    C. A black dash proceeding from the outer edge of ren. st. *A. suffusa.*
    CC. No black dash proceeding from the outer edge of ren. st.
      D. Inner margin of f.-w. broadly ferruginous. *A. fennica.*
      DD. Inner margin of f.-w. not broadly ferruginous.
        E. Orb. st. conspicuously pale. *A. lunigera.*
        EE. No quadrate black spot between the stig.; orb. st. not conspicuously pale.
          F. The three stig. well defined.
            G. The clav. st. entirely blackish. *A. exclamationis.*
            GG. The clav. st. only outlined with blackish.
              H. H.-w. white or pale grey. *A. segetum.*
              HH. H.-w. dark grey. *A. corticea.*
          FF. The clav. st. hardly perceptible.
            I. F.-w. blackish brown; the ren. st. dark grey. *A. saucia.*

II. F.-w. pale grey, with distinct lines and cen. sh. *A. cinerea.*

III. F.-w. greyish ochreous.

K. Lower half of ren. st. dark grey. *A. cursoria.*

KK. Entire ren. st. brownish. *A. ripæ.*

EEE. A quadrate black spot between the stig.

L. No pale streak from the base. *A. nigricans.*

LL. A pale streak from the base *near* the costa.

M. The streak whitish. *A. Tritici.*

MM. The streak greyish ochreous. *A. aquilina.*

LLL. A pale streak from the base *along* the costa.

N. A pale spot in subt. l. at anal angle. *A. agathina.*

NN. No pale spot in subt. l. *A. obelisca.*

The remainder of the genus I am unable to get in a tabular form. *A. præcox* is readily known by its green fore-wings and reddish band before the subt. l. *A. porphyrea* has the i. l. as angulated as in *A. valligera;* but the dull red ground-colour of the fore-wings distinguishes it readily, besides its being so much smaller an insect.

The other four species, *A. ravida, pyrophila, lucernea* and *Ashworthii,* may be thus distinguished from each other (the broader and more truncate fore-wings assist to separate them from any of the preceding species):—

Ashworthii. F.-w. slaty grey, with the lines black; the stig. distinct.

Lucernea. F.-w. greenish grey, with the lines darker; the stig. indistinct.

Pyrophila. F.-w. dull brown; h.-w. greyish brown.

Ravida. F.-w. dull reddish brown; h.-w. whitish.

A. VALLIGERA. 1″ 3‴—1″ 5‴. F.-w. grey more or less tinged with ochreous, with sharply darker markings, especially the clav. st.; the pale orb. st. in a dark subcostal patch; ren. st. dark grey, surrounded by whitish; a row of black wedge-shaped spots precedes the subt. l. VII, VIII.

Larva dull greenish grey, with paler dorsal and darker subdorsal line; two rows of black dots between them; a row of short white streaks on each side of the spiracles (*Freyer*). At the roots of grasses. X—V.

Bi.!! Da.! Ed.! L.D.! St. Y.

A. PUTA. 1″ 2‴—1″ 3‴. F.-w. greyish ochreous, with a brown-black blotch at the base of the costa, and another beyond the middle, enclosing the ren. st.; the orb. st. is almost linear. Varieties occur with the f.-w. of a uniform dark grey-brown, with only the inner margin at the base and the margins of the orb. st. paler. VIII, IX.

LARVA UNKNOWN.

Bi. Brg.!! Brs.! Ca. Ex. Ha.! Lw. Ly. Pl. St. Tn. Wa.

A. SUFFUSA. 1″ 8‴—1″ 11‴. F.-w. pale grey, broadly suffused with black-brown along the costa, with a black dash proceeding from the middle of the outer edge of the ren. st., and with 2 black wedge-shaped marks a little beyond it, preceding the dark hind-margin: h.-w. greyish white, with a pearly tinge, with the veins brownish. VI?—IX.

Larva shining grey, without any markings (*Treitschke*). On the roots of grasses. V.

Common everywhere.

A. FENNICA. 1″ 9‴. "F.-w. dark violet-grey along the costa, broadly ochreous or ferruginous on the inner margin; the stig. with distinct yellowish outlines" (*H.-S.*) VII, VIII.

LARVA UNKNOWN.

One specimen has occurred in Derbyshire.

A. SAUCIA. 1″ 1‴. F.-w. dark blackish brown, often clouded with red towards the costa; the ren. st. distinctly darker: h.-w. whitish, with the margins, veins and central lunule dark brownish grey. VII—IX.

Larva greyish brown, with darker lozenge-shaped marks along the back, intersected with paler dorsal line; subdorsal line and spiracles dark brown (*Freyer*). On plantain and dock. XI.

Brg. *Brs.* Ca. L.D. Lw. Ly. M. Sh. Wr.

A. SEGETUM. 1″ 3‴—1″ 8‴. F.-w., ♂ greyish brown, sometimes with an ochreous tinge, often suffused with darker towards the costa; the lines and stig. darker, and a dark cloud at the hind-margin; ♀ dark greyish brown, with all the markings more or less concealed in the ground-colour: h.-w. white. VI and IX.

Larva shorter and fatter than *A. exclamationis*, greenish grey, with paler dorsal line; pale brown subdorsal line; spiracles and ordinary spots black (*Hub.*) On roots of various grasses. IX—V.

Abundant everywhere.

A. LUNIGERA. 1″ 4‴—1″ 7‴. F.-w. grey shaded with reddish brown; the orb. st. conspicuously pale grey; the ren. st. outlined with black, filled up with red-brown, with a pale streak on the inner edge: h.-w. white, with a dark grey line on the hind-margin: ♀ with grey margin, veins and lunule. VIII.

LARVA UNKNOWN.

Ed. Isle of Wight.

A. EXCLAMATIONIS. 1″ 4‴—1″ 7‴. F.-w. pale brown more or less tinged with reddish grey; clav. st. entirely brown-black; ren. st. conspicuously darker; on the costa are 3 pale spots at the commencement of the first 3 lines. VI—VIII.

Larva dull dirty grey, with subdorsal and spiracular lines paler; spiracles and other spots black (*Hub.*) On roots of grasses and various low plants. IX—V.

Abundant everywhere.

A. CORTICEA. 1″ 4‴—1″ 7‴. F.-w. pale greyish brown clouded and IRRORATED with darker; a dark brown blotch near the base; the stig. dark brown; inside of clav. st. paler, sometimes with a broad dark brown band towards the hind-margin: h.-w. greyish brown. VII.

LARVA UNDESCRIBED.

Bi.! Brg.!! Brs. Ca. Ed.! Ha. L.D. Lw. Pl. St. Tn.! Wa. Wr. Y.

A. CINEREA. 1″ 4‴. F.-w. pale slaty grey, with the 1st, 2nd and 3rd transverse lines black; cen. sh. rather cloudy dark grey; ren. st. dark grey. VI.

Larva shining greenish brown; dorsal and subdorsal lines darker; between them are small, oblique, dark streaks (*Treitschke*). On roots of various low plants. IX—V.

Brg. *Brs.* Ha. Lw.

A. RIPÆ. 1″ 6‴. F.-w. greyish ochreous; the lines rather indistinct; the el. l. and subt. l. indicated by dots; orb. st. very small and hardly darker than ground-colour; ren. st. darker, almost brown; clav. st. small: h.-w., ♂ white, with a dark line on hind-margin; ♀ greyish white, with pale brown veins. VI, VII.

LARVA UNKNOWN.

L.D.

A. CURSORIA. 1″ 4‴ — 1″ 6‴. F.-w. pale greyish ochreous, with the lines darker; margins of the stig. whitish; the lower half of the ren. st. dark grey; a dark brown cloud along the hind-margin: h.-w. whitish, with pale grey marginal band, veins and central lunule. VII, VIII.

Larva pale ochreous, with dark brown dorsal line; spiracular line whitish, edged above with brown; ordinary spots black (*Freyer*). On spurge (*Euphorbia Esula*). V, VI.

Bi.!! Ed.! L.D.

A. NIGRICANS. 1″ 5‴—1″ 7‴. F.-w. dull dark brown clouded with black, sometimes with a reddish tinge; the most conspicuous markings are, a short blackish streak from near

the middle of the base, a black spot before the orb. st., and a rhomboidal black spot between the stig.; orb. st. sometimes pale; ren. st. always so, especially its hind-margin. VI—VIII.

Larva shining brown, with black dots and a paler indented line (*Treitschke*). On low plants. V, VI.

Brg.!! Brs.! Ca.! Da. Ed.!! Ex. Ha.!! Hu. K.! M.! Sc.! Sh. St.! Y.!!

A. Treitschkei. 1″ 2‴—1″ 3‴. F.-w. greyish brown, with darker cloud; a whitish grey streak from the base near the costa; stig. conspicuously paler; hinder edge of the ren. st. well defined; 3 wedge-shaped black spots precede the rather distinct subt. l. VIII.

Larva shining grey (*Treitschke*). On grass and low plants. V.

Bi.!! Brg.! Brs.! Da.! Ed.! Ex.! L.D.! Lw. M. Sc.! St.!! Y.

A. aquilina. 1″ 2‴—1″ 5‴. F.-w. pale brownish more or less tinged with ochreous or grey; a pale ochreous streak from the base near the costa; stig. conspicuously paler; hind-margin of the ren. st. ill defined; 3 or 4 blackish wedge-shaped streaks precede the very indistinct subt. l. VII, VIII.

Larva: head pale brown; body lighter; dots black; sides brownish grey (*Treitschke*). On *Galium verum* (yellow lady's bedstraw). V.

Bi. Brg.! Ca. Lw. M. Pl. Sc.! Y.!

A. obelisca. 1″ 4‴—1″ 6‴. F.-w. greyish brown, with the costa from the base broadly ochreous-grey; a blackish brown streak from the middle of the base; a black-brown spot precedes the orb. st., and a black-brown rhomboidal spot lies between the stig. VIII.

Larva: head pale brown; body much lighter; black dots hardly perceptible; dark grey dorsal stripe (*Treitschke*). On low plants. V.

Brg.! Ed.! Sc.

A. AGATHINA. 1″ 1‴—1″ 5‴. F.-w. reddish grey, with the lines blackish; the costa broadly paler from the base to beyond the middle; a conspicuous, wedge-shaped, black spot before the pale orb. st., and the space between the 2 stig. also black; in the subt. l. is a pale spot near the anal angle. VIII.

LARVA UNKNOWN.

Ly. Weybridge; West Wickham. Among heath.

A. PORPHYREA. 11‴—1″ 2‴. F.-w. dull dark red, with blackish lines margined with pale grey, and with several short black streaks, especially along the fold; the orb. st. white; ren. st. pale reddish grey. VI, VII.

Larva reddish orange, with a row of conspicuous white spots down the back, edged with blackish; head brown (*Hub.*) On heath. VIII.

Bi.! Brs.! Ed.!! Ex.! Hu.!! Lw. Ly.! M. Sc.! Sh. Tn. Wa.! Y.!

A. PRÆCOX. 1″ 7‴—1″ 9‴. F.-w. dull greenish, varied with paler and with darker lines; central portion of the stig. reddish, and a narrow, reddish, waved band before the subt. l. VIII.

Larva dull ochreous, with whitish dorsal and spiracular lines; head ochreous; 2nd, 12th and 13th segments whitish (*Roesel*). On various low plants. V.

Bi.! Ed. L.D. M.! Sh.

A. RAVIDA. 1″ 8‴—1″ 9‴. F.-w. dull brown, sometimes with a slight rosy tinge, with the lines paler and the ELONGATE obliquely placed orb. st. also paler, sometimes preceded by a dark margin; the space between the stig. sometimes black: h.-w. whitish, with pale greyish brown hind-margin and veins. VII, VIII.

Larva pale brownish ochreous, with paler dorsal line; a white subdorsal line edged above with brown and surmounted by a row of white dots; spiracular line whitish, with a row of

brownish spots above it (*Freyer*). On dock and other low plants. IV.

Bu. *Ca.!* Da.! Ed. Ha. Sc.!! St. Wr. Y.!

A. PYROPHILA. 1″ 7‴—1″ 8‴. F.-w. greyish brown; lines slightly paler; ROUND orb. st. hardly paler; ren. st. mostly filled up with dark brownish: h.-w. greyish brown. VII, VIII.

Larva dull grey-brown (*Treitschke*). On grasses and low plants. IV.

Ed. Ha. L.D. *Wa.* Wr. Y.

A. LUCERNEA. 1″ 4‴—1″ 8‴. F.-w. shining grey, with a slight greenish tinge; lines and cen. sh. darker; stig. not perceptibly defined: h.-w. dark greyish brown. VII.

Larva dark greenish grey, with a double dorsal series of yellowish white spots, each spot bounded anteriorly by a black shade (*Logan in lit.*) On dandelion and other low plants. II, III.

Ed.!! L.D. Pl.

A. ASHWORTHII. 1″ 5‴—1″ 6‴. F.-w. slaty grey, with the 4 lines black, first 3 very distinct; el. l. much serrated; stig. hardly darker than ground-colour; cen. sh., passing between them, forms there a quadrate black spot: h.-w. grey; the veins a little darker. VII.

Larva green; dorsal line pale; lateral line whitish, surmounted by a row of black spots. (Will eat heather and harebell, *Campanula rotundifolia*).

Llangollen.

Genus 3. TRIPHÆNA.

Imago: antennæ slightly pubescent in the male; abdomen not crested, flattened, terminating in a truncate tuft of hair; fore-wings elongate, thick; HIND-WINGS well developed, YELLOW, WITH A BROAD BLACK BORDER.

Larva thick, larger posteriorly, with distinct lines, the subdorsal surmounted by a row of black dots; feeding on low plants, and concealed by day amongst leaves or on the ground.

Pupa subterranean.

The six species of the genus may be thus distinguished:—

A. H.-w. with no black lunule, nor black at the base.
  B. H.-w. orange, with very broad black border. *T. fimbria.*
  BB. H.-w. yellow, with rather narrow black border. *T. pronuba.*
AA. H.-w. with a black lunule, or the base black.
  C. The black border broad; the lunule none or indistinct.
    D. F.-w. with two pale violet blotches on the costa; (h.-w. with no lunule). *T. Ianthina.*
    DD. F.-w. dull red, with no violet markings; (h.-w. with a lunule almost concealed in the black at the base). *T. interjecta.*
  CC. The black border rather narrow; the lunule very distinct.
    E. A black spot on the costa of f.-w. before the subt. l. *T. subsequa.*
    EE. No black spot on the costa of f.-w. *T. orbona.*

T. Ianthina. 1″ 5‴—1″ 8‴. F.-w. brownish, with a violet or reddish tinge; a pale blotch from the costa extending to the orb. st., and a pale waved band beyond the ren. st.: h.-w. orange, clouded with black at the base, and with a broad black band before the hind-margin. VII, VIII.

Larva greyish ochreous, with paler dorsal line; a pair of conspicuous black spots on each of the 9th to 12th segments; spiracles white (*Freyer*). On primroses and various low plants. IV.

Common everywhere.

T. fimbria (Broad-bordered Yellow Underwing). 2″—2″ 3‴. F.-w. pale or dark olivaceous, with the margins of the stig. and 2 hinder lines conspicuously paler: the space between these 2 lines forms a broad pale band, with only a conspicuous blotch on the costa: h.-w. deep orange, with a broad intensely black band before the hind-margin, broadest towards the costa. VI, VII.

Larva brown, with paler dorsal line; a row of oblique whitish stripes, alternating with some white spots, in the place

of the subdorsal line (*Dup.*) On primrose and various low plants. III, IV.

Bi. Brg.! Brs. Bu. Da. Ed. *Ex.* Ha. Hu.!! L.D. Lw. Ly.!! M. Pl. Pm. Sc.! Sh. St. Tn.! Wt. Wr. Y.

T. INTERJECTA. 1″ 3‴—1″ 4‴. F.-w. dull dark reddish, with darker lines and cen. sh.; the lower half of the ren. st. dark grey: h.-w. yellow, clouded with grey along the inner margin of the costa, in which cloud is a darker central lunule; before the hind-margin is a rather broad black band. VII, VIII.

Larva whitish ochreous streaked with pale yellow and brownish; dorsal line narrow and white; subdorsal line white, edged on each side with reddish; pale spiracular line edged above with a broad brownish stripe (*Gu.*) On various low plants. III, IV.

Bi. Brg. Brs. Bu. Ca. Ct.!! Ha !! K. Lw. Ly. M. Pm. Pl. Sc.! Sh. St.! Tn. Wa.! Wt. Wr. Y.

T. SUBSEQUA. 1″ 7‴. F.-w. greyish brown, with the usual markings of varied intensity; at the commencement of the 4th line is a BLACK SPOT on the costa: h.-w. dull yellow, clouded with grey at the base; a dark grey central lunule and a black band before the hind-margin. VII.

Larva brownish grey, with a slight greenish tinge; 2nd segment dark brown; dorsal and subdorsal lines paler; above the latter is a row of quadrangular blackish spots (*Freyer*). On various low plants. III, IV.

Ly. Sherwood Forest.

T. ORBONA. 1″ 6‴—1″ 10‴. F.-w. greyish brown or greyish ochreous, with the usual markings of variable intensity; NO BLACK SPOT on the costa before the 4th line: h.-w. yellowish, clouded with grey at the base; with dark grey central lunule and blackish band before the hind-margin. VII, VIII.

Larva ochreous-brown, marbled with darker on the back, and with a conspicuously paler spiracular line; the whitish spiracles are placed in large brownish blotches (*Hub.*) On various low plants. III, IV.

Abundant everywhere.

T. PRONUBA (Common Yellow Underwing). 1″ 10‴—2″ 3‴. F.-w. excessively variable in colour and marking, varying from reddish ochreous to dark reddish brown, sometimes with the costa broadly paler at the base, always with a black spot on the costa before the 4th line: h.-w. yellow, with a narrowish black band before the hind-margin. VI—VIII.

Larva grey or dirty yellowish green, with the dorsal and subdorsal lines paler; the latter surmounted by some large blackish spots from the 3rd to the 11th segments; spiracular line indistinct (*Gu.*) On almost all low plants. IV.

Abundant everywhere.

Genus 4. NOCTUA.

Imago: antennæ generally only slightly ciliated in the male, very rarely pectinated (only in *Subrosea*); abdomen not crested, slightly flattened: fore-wings obtuse at the tip (less elongate than in *Agrotis*); the stig. always distinct; THE CLAV. ST. GENERALLY OBLITERATED.

Larva thick, slightly larger posteriorly; with very distinct lines, the subdorsal surmounted by a row of black spots. Feeding on low plants, and concealed among grass or dead leaves during the day.

Pupa subterranean, not enclosed in a cocoon.

There are eighteen British species already known to us in this genus. They may be thus distinguished:—

A. The inner edge of half line of h.-w. distinctly margined with black.
  B. The outer edge of h. l. not margined with black.
    C. The black margin of h. l. forms two distinct spots.
      D. F.-w. slaty grey. *N. glareosa.*
      DD. F.-w. ochreous. *N. depuncta.*
    CC. The black margin of h. l. forms a line, not spots. *N. rhomboidea.*
  BB. The outer edge of h. l. margined with black, at least in the middle with a black blotch; (a black spot on costa at subt. l.)

E. Orb. st. triangular and flattened out, something like a V. *N. C-nigrum.*

EE. Orb. st. of an irregular oval form (not triangular).

F. Inner edge of ren. st. curved. *N. ditrapezium.*

FF. Inner edge of ren. st. straight. *N. triangulum.*

AA. The inner edge of h. l. not margined with black.

G. F.-w. dull brown, with no purple gloss.

H. Ren. st. margined with black; no cen. sh. *N. augur.*

HH. Ren. st. not margined with black; cen. sh. distinct. *N. umbrosa.*

GG. F.-w. brownish, with more or less of a purple or rosy tinge.

I. A pale streak along the costa from the base; (h.-w. white). *N. plecta.*

II. No pale streak along the costa from the base.

K. A black spot on costa before the subt. l. *N. baja.*

KK. No black spot on the costa before the subt. l.

L. Cen. sh. forms a dark spot between the stig.

M. F.-w. dark brown (purplish or dull reddish).

N. Orb. st. of the ground colour. *N. brunnea.*

NN. Orb. st. paler than the ground-colour. *N. bella.*

MM. F.-w. reddish ochreous or reddish grey.

O. Hind-margin of ren. st. distinct. *N. festiva.*

OO. Hind-margin of ren. st. indistinct; (antennæ of male pectinated). *N. subrosea.*

LL. Cen. sh. forms no dark spot between the stig.
P. Lower half of ren. st. not dark grey. *N. Dahlii.*
PP. Lower half of ren. st. dark grey.
Q. H.-w. whitish. *N. xanthographa.*
QQ. H.-w. grey.
R. F.-w. with dark hind-margin. *N. sobrina.*
RR. F.-w. with no dark hind-margin. *N. neglecta.*

N. GLAREOSA. 1″ 4‴—1″ 6‴. F.-w. pale grey faintly tinged with rosy, with 3 conspicuous black spots, the first being the inner edge of the h. l., the second immediately preceding the orb. st., the third lying between the stig.: h.-w. white in ♂, pale grey in ♀. IX.

Larva pale brown; dorsal and subdorsal lines paler, edged with dark brown; spiracular line yellowish (*Bdv.*) VI.
Brg.! Ed. Hu. L.D. Lw. Ly. M.! Pl. Sc.!! Tn. Y.

N. DEPUNCTA. 1″ 5‴—1″ 6‴. F.-w. ochreous shaded with brown, with 2 conspicuous black spots, the first forming the inner edge of the h. l., the second immediately before the orb. st.; between the stig. is a *brownish* spot: h.-w. greyish brown. VII, VIII.

x 3

Larva greyish brown; subdorsal line whitish, with a row

of black dots; spiracles white, in black rings (*Hub.*) On sorrel and other low plants. IV, V.

Ex. *L.D.!* M. Sc.!! St.

N. AUGUR. 1″ 8‴—1″ 9‴. F.-w. dull brown; the lines paler, with darker margins; the 3 stig. conspicuously margined with black. VI, VII.

Larva brownish orange; dorsal line paler; subdorsal line formed of oblique black streaks alternating with white spots; spiracles white, edged on each side with yellowish; head dark brown (*Hub.*) On various low plants. IV, V.

Common everywhere.

N. PLECTA. 1″ 1‴—1″ 2‴. F.-w. reddish brown, with a broad whitish-ochreous streak along the costa to beyond the middle; a white line from the middle of the base to the orb. st.; immediately beneath it is a blackish streak, which extends to between the stig., which are margined with white: h.-w. white. VI and VIII?

Larva dull reddish brown; subdorsal line composed of a row of white dots (*Hub.*) On various low plants. IV.

Common everywhere.

N. C-NIGRUM. 1″ 4‴—1″ 7‴. F.-w. greyish brown with a rosy tinge; from the i. l. to the ren. st. is a conspicuous black blotch, in which lies the whitish orb. st., of a flattened triangular form; before the subt. l. is a small black spot on the costa: h.-w. pale grey. VII, VIII.

Larva greenish grey, with yellowish dorsal line, pale green subdorsal line, and white spiracular line, the space between the last two lines being dark green (*Hub.*) On various low plants. IV.

Common everywhere.

N. DITRAPEZIUM. 1″ 6‴—1″ 8‴. F.-w. DARK ROSY BROWN, palest along the costa; h. l. with black margins; a blackish spot before the orb. st. and between the stig.; a blackish spot on the costa precedes the subt. l.: h.-w. yellowish grey, with darker hind-margin and central lunule. VII.

Larva greyish ochreous with a slight reddish tinge, with darker marks along the back, most conspicuous on the 11th and 12th seg. (*Hub.*) On various low plants. V.

Birchwood and New Forest.

N. TRIANGULUM. 1″ 6‴—1″ 8‴. F.-w. pale brownish with a slight rosy tinge; h. l. black-margined on both sides; i. l. black-margined externally; a dark brown spot before the rhomboidal orb. st., and a dark brown spot between the stig.; on the costa before the subt. l. is a blackish spot: h.-w. grey-brown. VI.

Larva reddish ochreous, marbled with darker along the back; with some elongate black spots along the subdorsal line on the 8th to 12th seg., most conspicuous on the 11th and 12th (*Hub.*) On various low plants. IV.

Bi. Brg.! Brs. Bu.! Ca.! Da. Ex. K.! Lw.! Ly.! M.! Pl. St. Tn. Wt.! Y.

N. RHOMBOIDEA. 1″ 5‴—1″ 8‴. F.-w. dark brown, with a faint purplish gloss; a conspicuous black spot from the costa to the fold before the orb. st., and a blackish spot between the stig., which are delicately margined with yellowish. VII.

Larva reddish brown, with the dorsal and subdorsal lines whitish, the latter interrupted on each segment, and connected above with a whitish spot (*Freyer*). On various low plants. IV, V.

Brs. Da. Sc.!! Wa. Wr.

N. BRUNNEA. 1″ 5‴—1″ 8‴. F.-w. dark brown, with a faint purplish gloss; ren. st. conspicuously ochreous-grey, its lower end dark grey; between the stig. is a dark brown spot; before the subt. l. the costa a little darker, but not forming a conspicuous spot: h.-w. greyish brown, with the fringes rosy. VII.

Larva brown, marbled with yellow along the back; with some conspicuous yellow spots along the subdorsal line, which is replaced by a series of black oblique streaks; spiracular line pale greyish yellow (*Hub.*) On various low plants. IV, V.

Bi. Brg.! Brs.! Bu.! Ca.! Da.! Hu.!! K.! L.D.! Lw.! Ly.! M.! Sc.!! St. Tn.! Wa. Wt.! Y.!

N. FESTIVA. 1″ 3‴—1″ 5‴. F.-w. ochreous clouded with grey or rosy; the stig. generally paler; lower half of the ren. st. greyish; the space between the stig. dark; before the orb. st. is generally a small dark brown spot; beyond the el. l. is frequently a dark band; on the hind-margin is a row of black dots. VI, VII.

Larva reddish, slightly mixed with ochreous and grey, darkest along the back; with a row of oblong blackish spots along the subdorsal line from the 5th to 12th segments (*Hub.*) On various low plants. IV, V.

Abundant everywhere.

N. DAHLII. 1″ 4‴—1″ 6‴. F.-w. reddish brown; cen. sh. darker, but not forming a dark spot between the stig.; ren. st. generally conspicuous from its paler margins: h.-w. grey-brown. VII, VIII.

Larva reddish mixed with grey, with paler dorsal and subdorsal lines; above the latter is a row of black dots in white rings (*Hub.*) On various low plants. IV, V.

Brs. Ed. Hu.! L.D.! Lw. Ly. M.! Pm.

N. SUBROSEA. 1″ 8‴. F.-w. pale shining grey with a strong rosy tinge; stig. conspicuously paler; a reddish brown spot before the orb. st., and another between the stig.: h.-w. whitish, with a dull grey marginal band and central lunule. VII.

Larva greyish flesh-colour marbled with brown; dorsal and subdorsal lines lemon-yellow, edged with brown; spiracular line broad, sulphur-coloured (*Gu.*) On *Myrica Gale* (bog myrtle). V, VI.

In the fens of Cambridgeshire and Huntingdonshire.

N. BELLA. 1″ 3‴—1″ 5‴. F.-w. dull reddish brown, with darker cen. sh., forming a dark brown spot between the stig., which are conspicuous from their pale yellowish grey margins. VI? VIII.

Larva greenish grey, with darker-edged white dorsal line; spiracular line pale greenish ochreous, edged above with darker, with faint indication of lateral oblique stripes along the subdorsal line. On various low plants. VI, VII.

Bi.! Brs.! Bu.! Ca.! Ed. Ex. Ha. K.! L.D.! Lw.! Ly.! M.! Pl.! Sh. Tn.! Wa.! Y.!

N. UMBROSA. 1″ 5‴—1″ 6‴. F.-w. dull brown, with darker lines and cen. sh. unusually well defined; stig. not paler than the ground-colour, and with dark margins. VIII.

Larva whitish grey, with black subdorsal lines (*Treitschke*). On grass and other low plants. IV, V.

Bi.! Brg.! Brs.! Bu.! Da. Ed.!! Ex.! Ha.! Hu. K. L.D.! Lw. Ly.! M.! Sc.!! Sh. Wa. Wr. Y.!

N. BAJA. 1″ 6‴—1″ 7‴. F.-w. rather pale reddish brown, sometimes with greyish tinge; a conspicuous black spot on the costa before the subt. l.; ren. st. dark grey, especially its lower half; cen. sh. darker, not forming a spot between the stig. VII.

Larva yellow-ochreous marbled with brownish, with yellowish dorsal line edged with black; yellowish subdorsal line, from which, on the 5th to 12th seg., an oblique yellow streak proceeds to the middle of the back (*Hub.*) On various low plants. IV, V.

Common everywhere.

N. SOBRINA. 1″ 4‴—1″ 6‴. F.-w. purplish brown; the lines rather darker; the stig. barely outlined; the lower half of ren. st. dark brown; the subt. l. forms a pale line in the dark hind-margin: h.w. grey-brown. VII.

Larva violet-grey marbled with yellowish white, with the dorsal and subdorsal lines ochreous-yellow, interrupted; spiracular line pale greyish, edged above with darker (*Gu.*) FOOD UNKNOWN.

Rannoch, in Perthshire.

N. NEGLECTA. 1″ 5‴—1″ 7‴. F.-w. pale grey (with a faint ochreous tinge) or reddish; lines faintly darker or indicated by black dots; stig. slightly paler than the ground-colour; the lower half of the ren. st. dark grey: h.-w. rather dark grey. VIII.

Larva green when young, afterwards livid or brownish (*Gu.*)

On twigs of heather at first, then on various low plants. X—V.

On heaths. L.D. Ly. Pm. Y.

N. XANTHOGRAPHA. 1″ 5‴—1″ 6‴. F.-w. greyish brown, with more or less of a reddish tinge; lines and central band darker; stig. conspicuously pale ochreous-grey; lower half of ren. st. dark grey; h.-w. whitish, with a rather broad greyish hind-margin. VIII.

Larva greyish ochreous; dorsal line paler; lateral line whitish, surmounted by a row of black spots. On grass. XI—IV.

Abundant everywhere.

Family V. ORTHOSIDÆ.

Imago: antennæ of the male pubescent or ciliated; abdomen not crested, often depressed; fore-wings more or less pointed at the tip; the two stigmata visible; the lower half of ren. st. often dark grey; the lines distinct; the subt. l. often straight.

Larva cylindric, velvety, with no eminences; feeding on the leaves of trees or low plants, and concealed during the day.

Pupa subterranean, enclosed in a cocoon of earth and silk.

The insects of this Family nearly all appear in early spring or at the close of autumn, and are associated in the mind of the collector with sallow-bloom and ivy-bloom. Some of the *Xanthias*, it is true, appear in August; but only two species appear in the middle of summer, *Orthosia suspecta* and *upsilon*. In the spring all the species of *Tæniocampa* and *Trachea* appear, also hybernated specimens of *Cerastis*, *Scopelosoma satellitia*, *Dasycampa rubiginea*, and *Hoporina croceago*. In September we find species of *Anchocelis* and *Xanthia*, *Orthosia lota* and *macilenta*. In October appear the Chestnuts (*Ceras-*

tis) and *Dasycampa rubiginea* and *Scopelosoma satellitia*. Only three of the Family are rare with us—*Pachnobia alpina*, of which only two specimens are known; *Cerastis erythrocephala*, which has only once occurred; and *Dasycampa rubiginea*, one of the great prizes for autumnal sugarers. A few species are local, such as *Tæniocampa leucographa*, *T. opima*, *Orthosia suspecta*, *Xanthia gilvago*, and *Cirrædia xerampelina*. The following species are so common that the young collector must be very stupid if he does not take them the first year:—*Trachea piniperda*, *Tæniocampa gothica*, *rubricosa*, *instabilis*, *stabilis*, *munda* and *cruda*, *Orthosia upsilon*, *lota* and *macilenta*, *Anchocelis rufina*, *pistacina*, *lunosa* (these last two very fond of light), and *litura*, *Cerastis vaccinii*, *spadicea*, *Scopelosoma satellitia*, *Xanthia cerago*, *flavago* and *ferruginea*.

Young collectors must be cautious not to admit the larva of the Satellite (*Scopelósoma satellitia*) into their breeding-cages, as it has a depraved taste, and, instead of confining itself to a vegetable diet, it eats with avidity other larvæ, not disdaining even to eat those of its own kind. Yet the perfect insect will be welcomed gladly, as on a mild night at the end of January or in February it is already on the move, and perhaps one of the first captures at sugar in the new year.

There are eleven genera in this Family, which are not very easy of tabulation.

A. The stig. conspicuously pale. Genus 1. Trachea; and 2. Pachnobia.

AA. The stig. not conspicuously pale.

B. Abdomen not flattened.

C. F.-w. grey or reddish (ochreous in *O. macilenta*); generally with lower half of ren. st. dark grey. Genus 3. Tæniocampa; and 4. Orthosia.

CC. F.-w. grey or reddish; generally with paler veins; lower half of ren. st. not darker. Genus 5. Anchocelis.

CCC. F.-w. yellow (reddish ochreous in *X. ferruginea*).

D. Hind-margin of f.-w. not angulated. Genus 10. Xanthia.

DD. Hind-margin of f.-w. angulated. Genus 11. Cirrædia.

BB. Abdomen flattened.

E. F.-w. yellowish orange.

F. H.-w. white. Genus 9. Hoporina.

FF. H.-w. dark grey. Genus 8. Dasycampa.

EE. F.-w. reddish brown.

G. Hind-margin of f.-w. dentate. Genus 7. Scopelosoma.

GG. Hind-margin of f.-w. not dentate. Genus 6. Cerastis.

Genus 1. Trachea.

Imago: antennæ of the male slightly ciliated; abdomen short and hairy; fore-wings thick, with a hairy texture; the stig. large and distinct.

Larva long, smooth, of bright colours; feeding on fir trees.

Pupa subterranean.

T. piniperda. 1″ 3‴—1″ 5‴. F.-w. reddish brown varied with pale orange; the h. l., i. l. and el. l. darker; orb. st. whitish, with a prolongation towards the ren. st., which has the margins whitish, and is filled up with orange. III, IV.

Larva green, with white dorsal, subdorsal and spiracular lines, the latter bordered beneath by an orange line. On fir trees. VII, VIII.

Bi.! Ed. Hu. Ly. M.! Sc.! Wa.! Y.!

Genus 2. Pachnobia.

Imago: antennæ of the male pubescent; abdomen smooth; fore-wings silky, with very distinct lines and spots.

Larva unknown.

P. alpina. 1″ 5‴. F.-w. pale grey, beyond the middle brownish; the first three lines slender, dark grey; the subt. l. composed of wedge-shaped black spots, two of which extend to the ren. st.; orb. st. pale grey and not margined towards the costa; ren. st. brown-grey; the cen. sh. between the stig. darker; clav. st. outlined with black, but not very distinct: h.-w. pale grey. VIII.

One taken by Mr. Douglas, in 1839, on Cairn Gowr, in Perthshire, at an elevation of 3000 feet; a second taken by Mr. Foxcroft, in 1854.

Genus 3. Tæniocampa.

Imago: antennæ ciliated in the male, or often pectinated; abdomen smooth, a little depressed; fore-wings entire, thick, powdery; the orb. and ren. st. well marked, the lower half of the latter filled up with dark grey. The wings in repose form a very sloping roof.

Larva long, smooth, attenuated in front and slightly thickened behind; feeding principally on trees.

Pupa short, enclosed in a loose earthen cocoon.

All the species of this genus frequent the blooming sallows in early spring.

There are eleven species, thus distinguished:—

A. A conspicuous black spot between the stig. and before the orb. st. *T. gothica.*

AA. No conspicuous black spot between the stig. or before the orb. st.

B. F.-w. reddish brown, with indistinct subt. l.

C. The stig. conspicuously paler. *T. leucographa.*
CC. The stig. only margined. *T. rubricosa.*
BB. F.-w. pale or dark grey or ochreous; if reddish brown, with a distinct subt. l.
D. Subt. l. distinct.
E. Subt. l. sharply indented near the costa. *T. instabilis.*
EE. Subt. l. hardly indented near the costa.
F. F.-w. grey or dark grey. *T. opima.*
FF. F.-w. reddish or brownish ochreous. *T. stabilis.*
FFF. F.-w. pale greyish ochreous. *T. gracilis.*
DD. Subt. l. indistinct.
G. Subt. l. preceded by two small black spots. *T. populeti.*
GG. Subt. l. preceded by two large black spots. *T. munda.*
GGG. Subt. l. preceded by no black spots.
H. H.-w. white with a pink tinge. *T. miniosa.*
HH. H.-w. grey. *T. cruda.*

T. GOTHICA. 1″ 3‴—1″ 5‴. F.-w. greyish purple; the h. l., i. l. and el. l. dark brown or almost black; the subt. l. pale ochreous; stig. of the ground-colour, BUT THE SPACE BETWEEN THEM AND UNDER THE ORB. ST. BLACK, and a small black dash in the fold. III, IV.

Larva green, irrorated with yellowish dots; dorsal and subdorsal lines yellowish; spiracular line white (*Hub.*) On broom, clover, lilac, &c. VI.

Common everywhere.

T. LEUCOGRAPHA. 1″ 4‴—1″ 5‴. F.-w. reddish brown, paler before the subt. l.; the i. l. and el. l. faintly indicated by black dots; ORB. ST. GREYISH OCHREOUS; ren. st. a little darker, its lower half almost brown. III, IV.

Larva green, sprinkled with brown and white dots; spiracular line rust-coloured, bordered above with black (*Treitschke*). On plantain. VI, VII.

L.D. *Y.* Leith Hill, near Dorking; Marlow.

T. RUBRICOSA. 1″ 3‴—1″ 5‴. F.-w. reddish grey; the four lines commencing as dark spots along the costa, but not continued across the wing; a dark spot on the costa running between the stig.; lower half of the ren. st. brownish. III, IV.

Larva dull reddish brown; dorsal and subdorsal lines whitish; spiracular line white: a row of white dots above the subdorsal line (*Hub.*) On dock. VI, VII.

Bi.! Brs.! Bu.! Ca.!! Da. Ed. Hu.! K.!! Lw. Ly. M.! Pl. Sc.! Sh. St. Wr. Y.!

T. INSTABILIS. 1″ 4‴—1″ 6‴. F.-w. pale grey, dark grey or reddish grey; the subt. l. pale ochreous, the other lines of variable intensity; stig. with pale ochreous margins; lower half of ren. st. blackish; the cen. sh. is also conspicuously darker. III, IV.

Larva green, dotted with black; dorsal, subdorsal and spiracular line yellowish green (*Freyer*). On oak, willow and sloe. V, VI.

Common everywhere.

T. OPIMA. 1″ 5‴—1″ 6‴. F.-w. brownish grey; the space between the i. l. and el. l. generally darker; the margins of the stig. and subt. l. pale ochreous. III, IV.

Larva brownish above; the sides yellowish green; the dorsal, subdorsal and spiracular lines paler (*Gu.*) On sallow. VI.

Bi.! Brs. L.D. M. Y.

T. POPULETI. 1″ 4‴—1″ 5‴. F.-w. grey with a faint violet tint; the lines commence as black spots on the costa; margins of the stig. and subt. l. greyish ochreous, THE LATTER PRECEDED BY TWO BLACK SPOTS NEARLY IN THE CENTRE. III, IV.

LARVA UNKNOWN.

Bi. Brs. Bu. Ca. Ct. Ha. K. L.D. M.! Sh. Y.

T. STABILIS 1″ 3‴—1″ 5‴. F.-w. reddish ochreous, more or less clouded with grey, with dark grey cen. sh.; ren. st. nearly filled up with grey; margins of stig., subt. l. and the veins running through it pale ochreous: h.-w. greyish brown. III, IV.

Larva pale green dotted with yellowish; dorsal and spiracular lines distinct, yellowish; subdorsal only indicated; front edge of 2nd seg. and line across the 12th seg. yellowish. On elm and oak. VI, VII.

Abundant everywhere.

T. GRACILIS. 1″ 5‴ — 1″ 6‴. F.-w. PALE GREYISH OCHREOUS: the lower half of ren. st. dark grey; subt. l. pale ochreous, preceded by a darker line: h.-w. whitish grey, with darker lunule and spots before the hind-margin. III, IV.

Larva rather dark green; dorsal and subdorsal lines paler, and a row of pale green dots between them; spiracular line whitish, edged above with green (*Freyer*). On willow. V, VI.

Bi.! Brs. Ca. Da. Ex. Hu. K. L.D. Lw. Wr. Y.

T. MINIOSA. 1″ 3‴—1″ 5‴. F.-w. orange-grey, darkest between the i. l. and el. l.; orb. st. nearly of the ground-colour, but with paler margins; ren. st. dark grey: h.-w. WHITISH, WITH FAINT ORANGE TINT, with darker central spot and line before the hind-margin. III, IV.

Larva blue; dorsal and subdorsal lines yellow; spiracular line yellowish, with a row of whitish dots above it (*Freyer*). On oak. V.

L.D.! Lw. Ly. Y.

T. MUNDA. 1″ 7‴—1″ 8‴. F.-w. greyish ochreous, with a reddish tint; subt. l. indistinct, PRECEDED IN THE MIDDLE BY TWO DISTINCT BLACK SPOTS; lower half of ren. st. dark grey; cen. sh. slightly darker than the ground-colour. III, IV.

Larva brown; dorsal line yellowish grey, with a row of yellowish dots on each side; spiracular line pale grey, edged above with dark grey; beneath it is a conspicuous

white spot on the 5th and 6th segment (*Freyer*). On elm and aspen. V, VI.

Bi. Brs.! Bu. Ca. Ex.! Ha. Hu. K. L.D. Lw. Ly. M.! Pl.!! St. Wr. Y.

T. CRUDA. 1″ 1‴—1″ 2‴. F.-w. pale brownish ochreous; margins of stig. pale ochreous; REN. ST. DARK GREY; subt. l. very indistinct; the other three lines indicated by black dots. III, IV.

Larva pale green, sometimes greyish or brownish; dorsal and subdorsal lines whitish green, between them a row of dark green dots; spiracular line and incisions of the segments yellowish (*Freyer*). On oak. V.

Common everywhere.

Genus 4. ORTHOSIA.

Imago: antennæ of male pubescent; abdomen smooth, but slightly hairy; fore-wings rather pointed at the tip, smooth, sometimes shining, the lines and spots tolerably distinct; the lower half of ren. st. blackish. The wings in repose form a very sloping roof.

Larva thick, velvety, marbled; the spiracular line only constantly distinct; feeding on trees or low plants; concealed by day among bark or in the herbage.

Pupa subterranean, enclosed in an oval cocoon.

We have four species, which may be thus recognized:—

A. Subt. l. wavy and not very distinct.
  B. Subt. l. preceded by a row of dark spots. *O. upsilon.*
  BB. Subt. l. not preceded by a row of dark spots. *O. suspecta.*
AA. Straight and very distinct.
  C. F.-w. grey. *O. lota.*
  CC. F.-w. ochreous. *O. macilenta.*

O. SUSPECTA. 1″ 1‴—1″ 3‴. F.-w. reddish brown with a faint violet tint; the first three lines darker; the subt. l.

paler; stig. with paler margins, rarely paler than the ground-colour. VII, VIII.

Larva unknown.

Ed. Hu.! L.D. M.! Y.

O. upsilon. 1″ 4‴—1″ 5‴. F.-w. purplish grey, with darker cen. sh., most conspicuous between the stig.; subt. l. ochreous-grey, preceded by a row of wedge-shaped blackish spots. VII.

Larva blackish brown; a broad paler dorsal stripe, enclosing a central chain-pattern; spiracular line ochreous-grey; all the legs very sprawling. On willow and poplar. VI.

Bi.! Brs.! Bu.! Ca.! Ex.!! K.! Lw. St. Y.

O. lota. 1″ 3‴—1″ 4‴. F.-w. grey, sometimes with an ochreous tint: lower half of ren. st. blackish; subt. l. pale ochreous, preceded by a reddish line. IX, X.

Larva greyish brown with a violet tinge, with white dots; dorsal line white, interrupted (*Treitschke*). On willow. V, VI.

Common everywhere.

O. macilenta. 1″ 4‴—1″ 5‴. F.-w. yellowish ochreous, with slightly darker cen. sh.; lower half of ren. st. grey or blackish; subt. l. pale yellow, preceded by a reddish line; the other lines indicated by black dots. IX, X.

Larva reddish brown, with numerous white dots; dorsal, subdorsal and spiracular lines white; the head remarkably small (*Freyer*). On beech. IV, V.

Bi.! Brg.! Brs.! Ca.! Ct.! Da.! Hu. K.! L.D.! Lw.! Ly.! M.! Sh.!! St. Wa. Y.

Genus 5. Anchocelis.

Imago: antennæ of male slightly pubescent; abdomen not crested, hairy at the sides; fore-wings pointed at the tip, smooth, slightly shining, often with the veins paler than the ground-colour, with distinct lines and spots. The wings in repose form a very sloping roof.

Larva rather elongate, velvety, marbled, with distinct lines;

feeding on low plants, under which they are concealed during the day.

Pupa subterranean.

Of this genus we have four species, which may be thus recognised:—

A. H.-w. grey.
  B. Hind-margin of h.-w. pale rosy. *A. rufina.*
  BB. Hind-margin of h.-w. grey or dark grey.
    C. Orb. st. very slender; no black spot on the costa before the subt. l. *A. pistacina.*
    CC. Orb. st. of usual. form; a conspicuous black spot on the costa before the subt. l. *A. litura.*
AA. H.-w. whitish, with grey marginal band and central lunule. *A. lunosa.*

A. RUFINA. 1″ 3‴ — 1″ 5‴. F.-w. orange-grey, with a tawny band between the h. l. and i. l.; tawny cen. sh., and tawny band between el. l. and subt. l., the lines themselves being pale greyish ochreous. IX.

Larva orange; dorsal line paler, a row of whitish dots on either side; spiracular line broadly white (*Hub.*) On oak. V.

Bi. Brg.! Brs.! Bu.! Ct.! Ed. Ex. Ha. Hu.! L.D.! Lw.! Ly.! M.! Sc.!! Tn.!! Wa. Wr. Y.!

A. PISTACINA. 1″ 4‴—1″ 5‴. F.-w. reddish grey or greyish ochreous or reddish ochreous, with the veins sometimes paler; the stig. dark grey, with paler margins; THE ORB. ST. EXCEEDINGLY NARROW; the lines are paler than the ground-colour, but frequently with darker margins; along the costa are 3 or 4 blackish spots: h.-w. GREY, with darker central spot. IX, X.

Larva green or dull ochreous, with white spots; the dorsal and subdorsal lines darker; spiracular line whitish (*Gu.*) On various species of dock (*Rumex*). V, VI.

Bi.! Brg.! Brs.! Ca.! Ct.! Ex. Ha.! K.! Lw.!! Ly. Sc.!! Sh.!! St. Tn.!! Wa.! Wr.! Y.!

A. LUNOSA. 1″ 3‴—1″ 4‴. F.-w. reddish ochreous or greyish brown, generally with the veins paler; the yellowish subt. l. preceded by a row of black spots; stig. grey or dark grey; the orb. st. only slightly flattened; H.-W. WHITISH, WITH GREY BAND NEAR THE HIND-MARGIN, and dark grey central lunule. IX.

Larva dull greyish green, sometimes green; dorsal and subdorsal lines whitish; spiracular line slender, white, and bordered above with black; the spots are black (*Gu.*) On grass. IV.

Bi.! Brg.! Brs.! Ca.! Da. Ed.! Ex.! K! L.D.! Lw.! Ly. Pl.!! Sc.!! Sh.!! St. Tn. Wa.! Wr.

A. LITURA. 1″ 3‴—1″ 4‴. F.-w. reddish brown; all the lines commencing as black spots along the costa, THAT AT THE COMMENCEMENT OF THE SUBT. L. THE LARGEST; orb. st. generally of the ground-colour; ren. st. dark grey: h.-w. dark grey. IX, X.

Larva green or pale brown; the spots yellowish; spiracular line whitish; dorsal and subdorsal lines and incisions of the segments paler than the ground-colour (*Freyer*). On willow, alder, and various low plants. VI, VII.

Common everywhere.

Genus 6. CERASTIS.

Imago: antennæ of male pubescent; abdomen broad, much flattened, not crested; fore-wings smooth, shining; apex truncate; hind-margin slightly denticulate. In repose the wings are almost flat.

Larva elongate, velvety, dull-coloured, with the plate on the 2nd segment well marked; feeding on low plants, under which it is concealed by day.

Pupa subterranean.

There are three species, thus distinguished:—

A. Hind-wings rather pale grey, with paler central band. *C. Vaccinii.*

AA. Hind-wings grey, with no central band.

B. F.-w. dark reddish brown; stig. indistinct. *C. spadicea.*
BB. F. w. reddish ochreous or reddish brown; the stig. paler. *C. erythrocephala.* (Distinguished also by its larger size).

C. Vaccinii (Chestnut). 1″ 2‴—1″ 3‴. F.-w. reddish brown; THE LINES PALER; a dark band between the h. l. and i. l., and between the el. l. and subt. l. and darker cen. sh.; lower half of ren. st. dark grey: h.-w. rather pale grey, generally WITH A PALE BAND beyond the middle. X, XI; II h—III h.

Larva dark brown; dorsal and subdorsal lines paler; the spots pale grey; spiracular line greyish ochreous (*Gu.*) On oak and on low plants. VI, VII.

Common everywhere.

C. spadicea (Dark Chestnut). 1″ 2‴—1″ 3‴. F.-w. dark reddish brown, WITH HARDLY ANY DISTINCT MARKINGS; lower half of ren. st. blackish; subt. l. and sometimes the el. l. paler: h.-w. dark grey, WITH NO PALE BAND. X, XI; II h—III h.

Larva dark brown; blackish brown between the subdorsal and spiracular lines; these lines are pale brown; the less distinct dorsal line of the same colour (*Gu.*) On sloe, hawthorn and low plants. V, VI.

Bi.! Brg.! Brs.! Bu.!! Ca.!! Ct.! Da.! Ha.! Hu. K.! L.D. Lw.! Ly.! M.! Sh.! St. Tn. Wa. Wt.! Wr. Y.

C. erythrocephala. 1″ 5‴—1″ 7‴. F.-w. reddish ochreous or reddish brown: the stig. greyish ochreous; the lower half of the ren. st. containing 2 or 3 black dots: h.-w. grey, with no pale band. X, XI.

Larva brown-grey, with white dots; 2nd segment with a black plate, in which are two white lines (*Treitschke*). On low plants. V.

Near Brighton; one specimen in November, 1847.

In France this is as common in some localities as *C. Vaccinii.*

Genus 7. Scopelosoma.

Imago: antennæ of male ciliated; abdomen smooth, much flattened; fore-wings oblong; hind-margin dentate. In repose the wings are nearly flat.

Larva elongate, velvety, much attenuated anteriorly; feeding on low plants, trees, &c., when young; afterwards carnivorous.

S. satellitia (Satellite). 1″ 8‴—1″ 10‴. F.-w. reddish ochreous shaded with brown; the lines rather darker; orb. st. of the ground-colour; ren. st. white or bright orange, with two minute spots of same colour at each end of it. X, XI.; II h—IV h.

Larva dark black-brown, with three white lines on the back of the 2nd seg., and a white spot on the 2nd, 3rd, 4th, 5th and 12th seg. below the spiracular line (*Hub.*) On oak, beech, elm, &c. V, VI.

Common everywhere: generally abundant.

Genus 8. Dasycampa.

Imago: antennæ of male pubescent; abdomen smooth, rather flattened; fore-wings not denticulate, with distinct lines, but dotted; lower half of ren. st. very distinct.

Larva cylindrical, covered with short tufts of hair; feeding on low plants.

Pupa in a loose cocoon, mixed with earth.

In a group of insects where all the larvæ are so constantly naked the occurrence of the hairy larva of this genus is rather startling.

D. rubiginea. 1″ 4‴—1″ 5‴. F.-w. pale yellowish

orange, with numerous black dots; the lower half of ren. st. forming a black spot. X, XI; III h—IV h.

Larva yellowish brown, with a blackish spot on the back of each seg. (*Gu.*) On oak and various other plants. VI, VII.

Brg. Brs. Ex. Ly. Pl. Wr.: and of course Norbury Park, Mickleham, Surrey.

Genus 9. Hoporina.

Imago: antennæ long, slightly pubescent in male; abdomen smooth, much flattened: fore-wings indented on the costa, acute at the tip, with distinct lines and spots.

Larva not attenuated; head large, flattened; 12th segment slightly humped; feeding on oak.

Pupa subterranean.

H. croceago. 1″ 3‴—1″ 4‴. F.-w. pale orange; the first 3 lines formed of black dots; the subt. l. dark grey; the cen. sh. is narrow, greyish orange, and sharply angulated in the middle: h.-w. white, with a dark grey central band. X, XI; III h—IV h.

Larva reddish yellow; a row of oblique blackish lines down each side of the back from 5th to 12th seg., which meet in the middle of the back (*Gu.*) On oak. V, VI.

Brg. Lw. Ly. Tn. Wr.

Genus 10. Xanthia.

Imago: antennæ of male slightly ciliated; abdomen slender, a little flattened; fore-wings, tip pointed, slightly falcate, yellow or ferruginous, with distinct lines and spots; subt. l. often composed of dots. In repose the wings form a very inclined roof.

Larva short, thick, attenuated in front; feeding in the

catkins or buds of trees, at least when young; afterwards feeding on low plants.

Pupa subterranean.

We have six species in this genus:—

A. F.-w. yellow.
  B. F.-w. with lines; no blotches. *X. citrago.*
  BB. F.-w. with blotches.
    C. Head and front of thorax purple. *X. flavago.*
    CC. Head and front of thorax yellow.
      D. Hind-margin of f.-w. yellow; hind-wings white. *X. cerago.*
      DD. Hind-margin of f.-w. purple; hind-wings yellowish. *X. aurago.*
AA. F.-w. ochreous.
      E. H.-w. whitish. *X. gilvago.*
      EE. H.-w. grey. *X. ferruginea.*

X. CITRAGO. 1″ 4‴—1″ 5‴. F.-w. pale orange, with the h. l. and i. l. slightly darker; the el. l. and almost straight cen. sh. brownish: h.-w. whitish. IX.

Larva grey; dorsal and subdorsal line whitish, the latter edged above on each seg., with a black spot and three or four white dots; spiracular line whitish, edged above with black (*Freyer*). On lime. V, VI.

Bi. Brs.! Ex.! Ha. Hu. K. Lw. M. Sh. St. Wr. *Y.*

X. CERAGO. 1″ 4‴—1″ 6‴. F.-w. pale yellow, with dull purplish band near the base, and a broader irregular purplish band beyond the middle: lower half of ren. st. dark grey; head and front of thorax PALE YELLOW: h.-w. white. IX.

Larva violet-brown; dorsal line bordered by two pale lines; spiracular line greyish (*Gu.*) In the catkins of sallow; afterwards on low plants. IV, V.

Bi. Brs.! Bu.!! Ca.! Ct.! Da. Ed. Ha. Hu. L.D. Lw. Ly. M.! Sc.!! Sh. St. Tn. Wt. Y.!

X. FLAVAGO. 1″ 4‴—1″ 5‴. F.-w. deep orange, with a purplish blotch on the costa near the base, and a broad

irregular purplish one beyond the middle; lower half of ren. st. dark grey; head and front of thorax PURPLISH. IX.

Larva reddish brown, with numerous brown, red, yellow and white dots, by which a paler lateral stripe is formed (*Freyer*). On various low plants. VI.

Bi.! Brs.! Bu.! Ca.! Ct.! Da. Ed. Ex. Ha. Hu. Lw. M.! Sc.!! Sh. St. Tn. Wt. Y.!

X. AURAGO. 1″ 3‴—1″ 5‴. F.-w. DEEP ORANGE, with greyish purple band near the base, and another beyond the el. l., which is only intersected by the orange subt. l.; stig. purplish grey: h.-w. PALE ORANGE-GREY, whitish towards the base. IX.

Larva grey, with oblique darker streaks (*Treitschke*). On beech. V.

Brg. Brs. Ha. St. Wr. *Y.*

X. GILVAGO. 1″ 3‴—1″ 5‴. F.-w. OCHREOUS WITH A GREYISH TINGE and dark grey markings; a broad dark grey cen. sh., and dark grey band beyond the el. l.; some blackish spots generally before the subt. l.; lower half of ren. st. dark grey. IX.

LARVA UNDESCRIBED, because so common (*Gu.*) On the seeds of the elm.

Bu. Ca. Sh. *Y.* Doncaster, Rotherham; Bourne, in Lincolnshire.

X. FERRUGINEA. 1″ 5‴—1″ 7‴. F.-w. REDDISH OCHREOUS more or less tinged with grey, especially towards the hind-margin, where the pale ochreous subt. l. is preceded by a REDDISH LINE; lower half of ren. st. dark grey; orb. st. of the ground-colour, but very distinctly margined. IX, X.

Larva pale reddish brown, with many smaller darker spots; dorsal line paler, most distinct on the hinder segments; spiracular line pale (*Treitschke*).

On the young buds of the poplar. IV, V.

Common everywhere.

Genus 11. Cirrœdia.

Imago: antennæ of male slightly ciliated; abdomen smooth, slender, hardly flattened: fore-wings dentate and distinctly angulated; lines well marked.

Larva short, thick, marbled; living on ash.

Pupa subterranean.

C. xerampelina. 1″ 4‴—1″ 5‴. F.-w. deep yellow, with purplish grey hind-margin, and broad purplish grey band between the I. L. and El. L., but not reaching to the costa, including, however, the darker ren. st. IX.

Larva greyish brown, marbled; spiracular line paler, interrupted, and edged with black; subdorsal line pale and edged above with darker (*Gu.*) On ash. VII?

Brs. Bu. Ca. Da. Ha. Sc.! St. Wr. Y.

Family VI. COSMIDÆ.

Imago of moderate size; antennæ generally simple; abdomen smooth, slender in male, often with a projecting ovipositor in female; fore-wings rather acute at the tip. Wings in repose forming a very inclined roof.

Larva elongate, bright-coloured, rather flattened beneath; living enclosed between leaves of trees (in the style of a *Tortrix* larva).

Pupa short, often covered with a bluish dust; enclosed between leaves or amongst moss, or in earthen cocoons upon the surface of the ground.

This Family is the least extensive we have yet come to among the Noctuina, comprising only eight British species. Some of them are pretty, from the contrast of colours or sharpness of marking; and most of the species are common, and, though a few are rather local, none seem actually rare. The young collector may reasonably expect to meet with

Tethea subtusa, *Cosmia affinis* and *diffinis* his first season; and of *C. trapezina* he will probably meet with more than he likes (in his breeding-cage), the appearance of one being as ominous as that of a large pike in a preserve of young trout. *Cosmia pyralina* and *Dicycla Oo* may be met with readily by visiting their haunts; and a similar step would probably result beneficially in supplying the collector with *Euperia fulvago* and *Tethea retusa*.

As the *Cosmiæ* mostly appear during the wet weather so prevalent at the end of July, there is perhaps, in the minds of many collectors, rather an unpleasant association of ideas with these insects.

The four genera in this Family may be thus tabulated:—

A. F.-w. dark olive-green. Genus 1. Tethea.
AA. F.-w. ochreous.
  B. Stig. conspicuously whitish ochreous; the clav. st. distinct. Genus 3. Dicycla.
  BB. Stig. hardly paler than ground-colour; no clav. st. Genus 2. Euperia.
AAA. F.-w. reddish ochreous or reddish brown. Genus 4. Cosmia.

Euperia may always be instantly separated from *Cosmia* by the angulated inner line.

Genus 1. Tethea.

Imago: antennæ simple; thorax slightly crested: abdomen flattened, hairy at sides; ovipositor of female not protruded; fore-wings smooth and shining, the tip rather falcate, the lines and spots very distinct.

Larva smooth, shining, flattened beneath, attenuated behind; feeding between two leaves tied together with silk.

Pupa short, shining, not dusted.

We have two species, very similar, but which may be thus distinguished :—

A. I. l. and el. l. almost parallel. *T. retusa.*
AA. I. l. and el. l. converging at inner margin. *T. subtusa.*

T. SUBTUSA. 1″ 1‴—1″ 2‴. F.-w. olive-grey, with all the lines and margins of the 3 stigmata pale yellowish; the stig. are filled up with dark grey; THE I. L. IS NEARER THE BASE ON THE COSTA THAN ON THE INNER MARGIN. VII, VIII.

Larva yellowish green; dorsal and subdorsal lines pale yellow; spiracular line pale yellowish; head whitish green; mouth black (*Gu.*) On poplar. IV, V.

Bi. Brs. Bu. Ca. Ex. Ha.! Hu. K. L.D. Lw. M.! St. Wr. Y.

T. RETUSA. 1″—1″ 1‴. F.-w. dark olive-brown; the 3 first lines and margins of the stig. pale yellowish; THE I. L. NEARER THE BASE ON THE INNER MARGIN THAN ON THE COSTA (in fact, nearly parallel to the el. l., which itself turns outwards on the costa). VIII, IX.

Larva green, with the dorsal, subdorsal and spiracular lines whitish; head black (*Hub.*) On sallow and poplar. V.

Ca. Tn. Wa. Wr. Y.

Genus 2. EUPERIA.

Imago: antennæ ciliated in male; abdomen slightly depressed in male; female with protruded ovipositor; fore-wings with rather indistinct markings, the two middle lines almost parallel.

Larva smooth, elongate, almost cylindrical, with distinct lines and spots; living exposed on trees.

Pupa covered with a violet dust, enclosed in an earthen cocoon on the surface of the earth.

E. FULVAGO. 1″ 7‴—1″ 8‴. F.-w. pale ochreous, faintly tinged with grey or pale orange, with darker cen. sh.; i. l. and el. l. orange or dark grey, the i. l. sharply angulated. VIII.

Larva pale green or greyish; dorsal and subdorsal lines white; spiracular line whitish, edged above with black; the spots whitish (*Gu.*) On oak and birch. VI.

L.D.; and Sherwood Forest. One at Lewisham, in 1846.

Genus 3. Dicycla.

Imago: antennæ pubescent in male; abdomen rather depressed in male, pointed and with protruded ovipositor in female; fore-wings not falcate, with all the lines and the three stig. very distinct.

Larva elongate, slightly flattened, with large head, dull colours and sharp markings; living enclosed in bundles of leaves tied together with silk.

Pupa not dusted, enclosed in an oval cocoon placed on the surface of the ground.

D. Oo. 1″ 3‴—1″ 5‴. F.-w. whitish ochreous, with the lines, cen. sh., margins of stig., and veins greyish brown; a broad greyish brown blotch near the base. VI.

Larva brownish black, with the dorsal, subdorsal and spiracular lines brilliant white (*Gu.*) On oak. V, VI.

Ly. St. Tn. Wr.

Genus 4. Cosmia.

Imago: antennæ simple or slightly pubescent; abdomen slender, conical; ovipositor of female not protruded; fore-wings denticulated, with distinct lines, the el. l. much indented near the costa.

Larva smooth, rather flattened beneath, attenuated anteriorly; head small. Living within a packet of leaves united with silk.

Pupa dusted, the hind part very pointed and conical; either between leaves or in a cocoon on the surface of the earth.

There are four species in this genus:—

A. F.-w. greyish ochreous or reddish ochreous. *C. trapezina.*
AA. F.-w. reddish brown.

B. H.-w. grey.

C. Two conspicuous white spots on costa of f.-w. *C. diffinis.*

CC. No white spots on costa of f.-w. *C. pyralina.*

BB. H.-w. black or blackish. *C. affinis.*

C. TRAPEZINA. 1″ 2‴—1″ 5‴. F.-w. greyish ochreous or reddish ochreous, with darker central shade; the i. l. and el. l. whitish and margined with dark grey; the i. l. not angulated; a black dot at the lower end of the ren. st. VII, VIII.

Larva greenish, with the dorsal, subdorsal and spiracular lines white; the spots black or dark green (*Hub.*) On oak, birch, &c. Especially fond of other caterpillars. V, VI.

Abundant everywhere.

C. PYRALINA. 1″ 2‴—1″ 3‴. F.-w. reddish brown; the i. l., el. l. and much angulated cen. sh. blackish; a white streak on the costa beyond the el. l. meets another from near the apex: h.-w. GREY. VIII.

Larva pale green; dorsal and subdorsal lines paler green; spiracular line yellowish, edged above with black; the spots yellowish green; head dark green (*Freyer*). On plum and pear. IV, V.

Sh. St. Tn. Wr.

C. DIFFINIS. 1″ 2‴—1″ 3‴. F.-w. reddish brown, with the lines all paler; the i. l. and el. l. form on the costa CONSPICUOUS TRIANGULAR WHITE SPOTS. VII, VIII.

Larva pale green; dorsal and subdorsal lines whitish; spiraculine pale yellow; spots black and circled with white; head black (*Freyer*). On elm. V.

Brg.! Brs. Bu. Ca. Ex. Ha. K. Lw. Pl.!! St. Wa. Wt Wr.

C. AFFINIS. 1″ 1‴—1″ 2‴. F.-w. dull reddish brown; the lines all paler; whitish towards the costa; the darker cen. sh. slightly angulated; orb. st. with a central black dot: h.-w. VERY DARK GREY OR ALMOST BLACK. VII, VIII.

Larva bluish green; dorsal line broad, white; subdorsal and spiracular lines narrow, white; head pale green (*Gu.*) On elm. V.

Brs.! Ca.! Ex.! Ha.!! K.! Lw. Ly. Pl.!! Sh.! St.! Wa. Wt. Wr.

Family VII. HADENIDÆ.

Imago: antennæ rather long; abdomen more or less crested; fore-wings thick, with the ordinary spots and lines; the subt. l. never completely straight, and often forming a W in its middle. In repose the wings form a very inclined roof.

Larva elongate, smooth, not shining; the spots not raised: sometimes having the 12th segment humped. Feeding exposed or simply sheltered on trees or low plants.

Pupa shining, not dusted, and enclosed in oval cocoons, and buried more or less deeply.

The following are the names of the genera included in this Family:—1. EREMOBIA. 2. DIANTHÆCIA. 3. HECATERA. 4. POLIA. 5. DASYPOLIA. 6. EPUNDA. 7. VALERIA. 8. MISELIA. 9. AGRIOPIS. 10. PHLOGOPHORA. 11. EUPLEXIA. 12. APLECTA. 13. HADENA.

This Family contains thirteen genera, five of which consist of single species; three genera, *Dianthæcia*, *Hecatera* and *Euplexia* consist only of species of rather small size; the genera *Polia*, *Dasypolia*, *Miselia*, *Agriopis*, *Phlogophora* and *Aplecta* contain the largest in the Family; the remainder are of moderate size; but few species are gaily coloured, and some are very dingy. In the genus *Hadena* the indentation of the subt. l., forming a W, reminds one of the genus *Mamestra*, in the Family APAMIDÆ. In the three genera *Dasypolia*, *Epunda* and *Valeria* the antennæ of the male are strongly ciliated.

The demand for firm and constant characters is one we

would very readily supply if we could, and of which we feel the want as painfully as any of our readers can do. As Guenée observes, this Family shades off by such imperceptible gradations to the Orthosidæ, Apamidæ and Xylinidæ, that it is often impossible to draw a precise line of demarcation. But this is only a reproduction, on a small scale, of what occurs throughout Entomology, and even in general Zoology.

Several of the Hadenidæ are among our commonest species of Noctuæ, such as the well-known Angle Shades (*Phlogophora meticulosa*), *Aplecta nebulosa* and *advena*, *Hadena protea*, *dentina* and *oleracea*. These of course fall to the collector his first season; and he may also expect to meet with *Dianthæcia Cucubali*, *Polia flavocincta*, *Epunda viminalis*, *Miselia Oxyacanthæ*, *Agriopis Aprilina*, *Euplexia lucipara*, *Aplecta herbida*, *Hadena adusta*, *Chenopodii*, *Pisi* and *thalassina*. Many of the other species are local, others rather scarce. *Dianthæcia albimacula*, *Valeria oleagina*, *Miselia bimaculosa*, *Hadena satura* and *assimilis* are all *very* rare, and so was *Phlogophora empyrea* till last autumn.

Genus 1. Eremobia.

Imago: antennæ ciliated in male; abdomen crested in both sexes; fore-wings subdentate, with confused markings.

Larva elongate; head large; spots darker. Feeding exposed on the summits of grasses.

Pupa subterranean.

E. ochroleuca. 1″ 4‴—1″ 5‴. F.-w. pale ochreous varied with darker; a dark blotch from the middle of the costa includes the orb. st.; opposite to it is a smaller dark blotch on the inner margin; a brownish band between the el. l. and subt. l., intersected by a black streak opposite the ren. st.: h.-w. pale grey, with broad dark grey hind-margin. VII, VIII.

Larva yellowish green; spiracular line pale yellow; spots black (*Gu.*) On grasses. V, VI.
Brg.! Brs. Lw. St. Y.

Genus 2. Dianthæcia.

Imago: antennæ pubescent; abdomen crested at the base, in female terminating in an elongate cone, with a more or less protruded ovipositor; fore-wings marbled with distinct lines and spots, and the fringe varied; hind-wings with a small spot at the anal angle.

Larva smooth, velvety, attenuated at each end; head small; generally with oblique marks along the back. Feeding on *Silene, Lychnis,* &c., eating the seeds, and remaining, when young, rolled up in the capsules or buds.

Pupa terminating in a sharp point, the wing-cases protruding considerably beneath.

We have five species in this genus:—

A. F.-w. with no central white blotch.
  B. F.-w. ochreous. *D. carpophaga.*
  BB. F.-w. brown or purplish brown.
    C. Stig. united at their lower end. *D. Cucubali.*
    CC. Stig. not united. *D. capsincola.*
AA. F.-w. with central white blotch.
    D. F.-w. purplish black. *D. conspersa.*
    DD. F.-w. olive. *D. albimacula.*

D. carpophaga. 1″ 3‴—1″ 4‴. F.-w. pale brownish ochreous varied with darker; the clav. st. dark brown; the other stig. and lines pale ochreous; the subt. l. preceded by 2 or 3 wedge-shaped blackish spots. VI, VII.

Larva dark grey, with the dorsal line broadly whitish; subdorsal and spiracular lines pale grey; head reddish, with two dark brown lines (*Hub.*) On *Silene inflata.* VIII.
Brg.! Brs. Ca. Ha. Lw. Y.

D. capsincola. 1″ 4‴—1″ 6‴. F.-w. brown, with

darker markings; the margins of the stig. pale ochreous, NOT UNITED; subt. l. much waved, pale ochreous. VI.

Larva greenish grey; dorsal line darker, with an oblique streak proceeding from it on the back of each seg.; on each side of it is a row of black spots; subdorsal line indistinct; spiracular line broad and paler than the ground-colour (*Gu.*) On *Lychnis dioica.* VII, VIII.

Bi.! Brg. Brs. Bu. Ca.! Da. Ed. Ex. Hu. Lw. M. St. Wr. Y.

D. CUCUBALI. 1″ 3‴—1″ 5‴. F.-w. brown with slight purple tinge and darker markings; the margins of the orb. and ren. stig. pale ochreous, and UNITED AT THEIR LOWER ENDS; subt. l. pale ochreous, much waved. VI.

Larva anteriorly brownish orange, posteriorly greenish yellow; subdorsal line indicated by a row of white dots; from it slope some dark streaks towards the faintly indicated dorsal line; spots white. On *Silene inflata.* VII, VIII.

Brs. Bu. Ca.! Da. Ed. Hu. L.D. Lw. M. Sc.! St. Wt. Wr. Y.

D. ALBIMACULA. 1″ 4‴. F.-w. OLIVE-BROWN, darker in the middle; the 4 lines black, neatly edged with white; orb. st. edged with black, white, with an olive centre, placed in the middle of a large white blotch extending from the costa; ren. st. margined with black, with a little white towards the base, the rest olive: fringes chequered dark olive and white. VI.

Larva ochreous-yellow; dorsal line dark grey, with oblique lines proceding from it on each seg.; a row of black spots on each side; subdorsal line pale grey (*Gu.*) On *Silene nutans.* VII.

Taken near Birchwood in 1816; one specimen.

D. CONSPERSA. 1″ 3‴—1″ 4‴. F.-w. dark grey, with pure white markings; the ORB. STIG. AND A BLOTCH BELOW IT WHITE; the ren. st. pale grey; the lines whitish, margined with dark grey; a whitish dash along the inner margin. VI, VII.

Larva reddish ochreous; dorsal line grey, with oblique lines from it on each seg.; spiracular line whitish, edged above with grey (*Gu.*) On *Silene inflata* and *nutans*; most partial to *Lychnis Flos-cuculi.*

Brg.! Ca. Ed. Ha. L.D. Lw. M. Sc.! Y.

Genus 3. Hecatera.

Imago: antennæ pubescent in male; abdomen hardly crested. hairy at the sides; the female not with a protruding ovipositor; fore-wings with the two middle lines approximating on the inner margin, and enclosing a darker band.

Larva elongate; head small; no oblique dorsal stripes. Feeding on flowers of low plants, especially Compositæ, quite exposed.

Pupa with the apex pointed; without any prolongation of the wing-cases; enclosed in subterranean cocoons.

There are two species, readily distinguished by the ground-colour of the fore-wings, which is white in *H. serena* and grey in *H. dysodea.*

H. dysodea. 1″ 3‴—1″ 4‴. F.-w. pale grey; the first 3 lines whitish; the space between the i. l. and el. l. dark grey, all except the stig., which are pale grey; subt. l. very indistinct. VII.

Larva reddish green or dull brown; dorsal line darker; spiracular line pale green, edged above with dark brown; spots black (*Gu.*) On flowers and buds of lettuce. VII, VIII.

Ca. St. Wr.

H. serena. 1″ 3‴—1″ 4‴. F.-w. white; the lines white and margined with grey; space between the i. l. and el. l. dark grey; the margins of the stig. pale; a dark grey blotch on the costa before the subt. l., which is rather indistinct and preceded by four black spots. VI, VII.

Larva grey; a dark grey quadrate spot on the mlddle of each seg. on the back; spiracular line pale grey; incisions of

the seg. whitish (*Hub.*) On hawkweed or sow-thistle. VII, VIII.

Brg.! Ca.! Da. Ha.! Lw. Pl. Sh. St. Wa. Wt.

Genus 4. Polia.

Imago: antennæ of male slightly ciliated; abdomen elongate, crested on the anterior seg.; fore-wings cloudy, with the lines and spots rather confused.

Larva smooth, elongate, of lively and uniform colours; head large. Feeding exposed on herbaceous plants, generally extended along the stems.

Pupa smooth, the apex rather long; enclosed in a subterranean cocoon.

There are only two species in this genus, thus distinguished:—*P. Chi* has a distinct χ-like mark, which *P. flavocincta* has not.

P. Chi. 1″ 5‴—1″ 6‴. F.-w. whitish grey; the margins of the stig. and lines darker; the subt. l. preceded by a row of wedge-shaped black spots; a SHORT BLACK STREAK FORKED AT EACH END BELOW THE STIG. VIII, IX.

Larva sea-green on the back, grass-green on the sides; subdorsal line whitish; spiracular line whitish yellow (*Treitschke*). On lettuce, sow-thistle, &c. V.

Bi.! Bu. Da.! Ed.! Hu.!! L.D. M.! Sc.! St. Y.

P. flavocincta. 1″ 6‴—1″ 9‴. F.-w. pale grey varied with darker, and faintly suffused WITH PALE ORANGE; a darker cen. sh., and sometimes a row of darker spots before the subt. l. VIII, IX.

Larva yellowish green; spiracular line yellow, edged above with black; spiracles reddish white, edged with black (*Gu.*) On chickweed (*Alsine media*) and numerous other low plants. V—VII.

Brg.! Brs.! Ca.! Ct. Da.! K. Sc.!! St. Wa.! *Wt.* Wr. Y.

Genus 5. Dasypolia.

Imago: antennæ ciliated in male; thorax robust, woolly: abdomen short, thick, hairy above and at the sides; fore-wings broad, with long fringes, cloudy, with distinct lines and spots; hind-wings indented on hind-margin.

Larva unknown.

D. Templi. 1″ 8‴ — 1″ 10‴. F.-w. dull greyish ochreous; the i. l. and el. l. darker; the pale subt. l. preceded by a dark line; stig. very indistinct, hardly margined: h.-w. pale greyish, with a slight ochreous tint, and with two darker lines. X, XI; II h, III h.

Bi. *Brs.* Hu. *M.* Pl. Y. Fond of hiding itself amongst stones.

Genus 6. Epunda.

Imago: antennæ strongly ciliated in male; abdomen slightly crested, hairy at sides; fore-wings rather shining in certain lights, with well-marked lines and spots.

Larva elongate, smooth, of lively colours; living exposed, extended along the stems of low plants.

Pupa subterranean.

There are four species, thus recognised:—

A. F.-w. brown or black.
  B. Hinder edge of ren. st. conspicuously pale ochreous. *E. nigra.*
  BB. Hinder edge of ren. st. not conspicuously pale. *E. lutulenta.*
AA. F.-w. pale grey.
  C. F.-w. with a strong greenish tinge, and no black streak from the base. *E. lichenea.*
  CC. F.-w. not tinged with green, and with a black streak from middle of base. *E. viminalis.*

E. LUTULENTA. 1″ 6‴—1″ 7‴. F.-w. DARK BROWN, sometimes blackish; the margins of the stig. hardly indicated; the i. l. and el. l. sometimes visible, and the space between them darker: h.-w. of ♂ white, of ♀ grey. X.

Larva green, sometimes with a rosy tinge; dorsal line dark green; subdorsal and spiracular lines whitish (*Boisdv.*) On various low plants. IV.

Bi. Brg. Ca. L.D. Tn. Wr. Y.

E. NIGRA. 1″ 7‴—1″ 8‴. F.-w. BLACK; the hind-margin of the ren. st. CONSPICUOUSLY WHITISH; beyond it are 3 or 4 pale yellow dots on the costa; the cen. sh. and a blotch below the orb. stig. are of a deeper black: h.-w. of the ♂ whitish, of the ♀ grey. IX.

Larva yellowish green; dorsal and subdorsal lines pale violet; spiracular white, edged above with blackish (*Gu.*) On chickweed and dock. X to VI.

L.D. Lw. Ly. Pl.

E. VIMINALIS. 1″ 4‴—1″ 5‴. F.-w. pale grey, with whitish markings; A BLACK DASH FROM THE CENTRE OF THE BASE; the inner margin of the ren. st. black; below it the el. l. appears as a black line in continuation, from which a V-like mark proceeds towards the i. l. VII.

Larva green; dorsal, subdorsal and spiracular lines and incisions of the seg. white (*Roesel.*) On willow. V.

Brg. Brs. Bu. *Ca.!* Ct.! Ed. Ex. Ha.! Hu. Lw.! Ly. St. Tn. Wt. Wr. Y.!

E. LICHENEA. 1″ 4‴—1″ 5‴. F.-w. GREENISH grey, with the lines darker; the stig. pale grey; the subt. l. pale grey, preceded by some dark spots: h.-w. of the ♂ white, of the ♀ grey, with darker line beyond the middle and central lunule, and the veins darker. VIII, IX.

Larva dark green, inclining to olivaceous, with three rows of dusky black markings along the back; spiracular line pale green (*Brockholes*). On ragwort and other low plants. XI—IV.

Bi.! Brs. Pl.

Genus 7. Valeria.

Imago: antennæ strongly ciliated in male; abdomen crested; fore-wings toothed, with long fringes, and with distinct lines and spots.

Larva attenuated posteriorly; first three seg. much swollen, bigger than the head. It feeds exposed on shrubs.

Pupa enclosed in a cocoon formed of earth and silk.

V. oleagina. 1″ 7‴—1″ 8‴. F.-w. dull greenish; the ren. st. conspicuously white; the orb. st. only outlined with whitish; the subt. l. yellowish green and much indented: h.-w. whitish, with a brownish hind-margin, and transverse black line beyond the centre. III, IV. (Freyer says sometimes in autumn).

Larva dark brown, paler anteriorly; spiracular and subdorsal lines ochreous-brown; from subdorsal line a row of oblique ochreous streaks to the dorsal line (*Freyer*). On sloe. V, VI.

Fishguard, in Pembrokeshire; one in July, 1800.

Genus 8. Miselia.

Imago: antennæ thickened in male; abdomen crested, rather slender in male, very stout in female; fore-wings thick, dentate; the stig. very large; hind-wings with a black spot near the anal angle.

Larva elongate, convex above, flattened beneath; prolegs very long; head larger than neck; 12th seg. rather humped. Feeding on trees.

Pupa enclosed in an oval cocoon formed of silk and earth.

This genus contains two species, easily distinguished by the hind-wings; thus:—

A. H.-w. pale grey, with a central brown blotch. *M. bimaculosa.*

AA. H.-w. pale brown, with no central brown blotch. *M. Oxyacanthæ.*

M. Oxyacanthæ. 1″ 5‴—1″ 8‴. F.-w. pale REDDISH BROWN, with a greenish tinge along the inner margin; i. l. and el. l. black; a black dash from the base through the middle of the i. l.; beyond the el. l. on the inner margin is a WHITISH CRESCENT. IX, X.

Larva greyish brown or reddish brown, marbled with black, white and brown; dorsal line slender, black; the spots whitish (*Gu.*) On hawthorn and sloe. VI, VII.

Common everywhere; generally abundant.

M. BIMACULOSA. 2″—2″ 2‴. F.-w. PALE GREY varied with darker; the middle of the i. l. black; the ren. st. whitish, with a black dash through its lower end: h.-w. pale greyish brown, WITH A LARGE CENTRAL BROWN SPOT and another at the anal angle. VIII.

Larva brown, anteriorly darker; the spots white; spiracular line paler, edged above with dark; on the 12th seg. are two greyish points on the back (*Treitschke*). On elm. V.

Once near Bristol, in 1815.

The Parisian entomologists say we don't know how to look for this insect. *They* find the larvæ in the crevices of the bark of elm trees.

Genus 9. Agriopis.

Imago: antennæ pubescent, with a tuft of hair at the base; abdomen robust, slightly crested; fore-wings thick, with very distinct lines and spots.

Larva thick, smooth, cylindrical, with well-marked lines; living on trees, concealing itself in the bark during the day.

Pupa rounded in front, very pointed behind; enclosed in an earthen cocoon, and buried to a very great depth.

A. Aprilina. 1″ 7‴—1″ 10‴. F.-w. pale green, with the margins of the stig., cen. sh. and lines black, edged with whitish; HEAD AND FRONT OF THORAX PALE GREEN; TOP OF THE COLLAR BLACK. IX, X.

Larva reddish grey, streaked with black; dorsal line blackish; spots white, large (*Gn.*) On oak. VI.

Common everywhere; generally abundant.

By the character emphasized this can with certainty be distinguished from *Diphtera Orion*, which has the front of the thorax black and top of the collar green.

Genus 10. Phlogophora.

Imago: antennæ pubescent; abdomen long, hairy at the sides, slightly crested; fore-wings oblong-dentate, sometimes scolloped on the hind-margin, the two middle lines almost meeting on the inner margin; in repose they form a very inclined roof, and are sometimes even folded, giving the insect a very elongated appearance.

Larva cylindric, smooth, velvety, with oblique streaks along the back, almost polyphagous; feeding on low plants, and concealing itself under the leaves during the day.

Pupa in a subterranean cocoon.

There are only two species, including the recent addition, *P. empyrea*, which is immediately recognised by the pale inner margin and ren. st., as well as by the unscolloped hind-margin, the indentations of which form so conspicuous a character in *P. meticulosa*.

P. meticulosa (The Angle-shades). 1″ 1‴—2″. F.-w. pale ochreous, with a faint rosy tinge; an olive-brown patch

on the inner margin before the i. l.; a dark, triangular, brown blotch between the i. l. and el. l.; the orb. st. and ren. st. both of an oblong form and confluent. VI and IX, X.

Larva green or brownish, with numerous pale dots; the slender dorsal line white and interrupted; the spiracular line pale; the spiracles white (*Gu.*) On all low plants. XI—IV and VII, VIII.

Abundant everywhere.

P. EMPYREA. 1″ 10‴—1″ 11‴. F.-w. purplish brown, with darker blotches near the base below the stig. and on each side of THE REN. ST., which IS CONSPICUOUSLY PALE YELLOWISH, WITH A WEDGE-SHAPED PROLONGATION FROM ITS LOWER END TOWARDS THE BASE; a narrow whitish yellow streak along the inner margin. IX, X.

Larva greyish green or greyish brown, with pale dorsal and subdorsal lines, and a row of darker lozenges along the back; the spots yellowish white (*Boisdv.*) On various low plants; rather partial to pilewort. II—V.

Brighton and Lewes.

Genus 11. EUPLEXIA.

Imago: antennæ pubescent in male; abdomen hairy at sides, crested, and with a very thick crest on 3rd seg.; forewings dentate but not scolloped, broad, thick, with spots and lines distinct, slightly folded in repose.

Larva smooth, velvety, swollen posteriorly, with ill-marked lines; head small. Feeding on herbaceous plants.

E. LUCIPARA. 1″ 2‴—1″ 3‴. F.-w. greyish rosy, with a dark central band almost black, beyond which the ren. st. is conspicuously whitish; orb. st. is large, but rather indistinct; the hind-margin is blackish. VI, VII.

Larva green; dorsal line paler, with oblique dark streaks running to it; spots whitish; spiracles black (*Hub.*) On various low plants, foxglove, &c. VIII, IX.

Common everywhere.

Genus 12. Aplecta.

Imago: antennæ pubescent in male; abdomen long, hairy, slightly depressed, slightly crested on anterior seg.; fore-wings oblong, thick, subdentate; the stig. large and distinct; the lines rather distinct: in repose they form a slightly inclined roof.

Larva cylindrical, long, thick, smooth, of dull colours, generally with oblique marks along the back; feeding on low plants, under which it is concealed during the day.

Pupa subterranean.

We have five species in this genus.

A. F.-w. green. *A. herbida.*
AA. F.-w. brown. *A. advena.*
AAA. F-w. grey.
B. F.-w. dark grey; orb. st. conspicuously pale. *A. occulta.*
BB. F.-w. pale grey; subt. l. sharply angulated at inner margin. *A. nebulosa.*
BBB. F.-w. silvery grey; subt. l. only slightly curved at inner margin. *A. tincta.*

A. herbida. 1″ 8‴—2″. F.-w. green; the lines black, distinctly margined with pale green, except the subt. l.; a white dot near the inner margin before the i. l., and 3 or 4 beyond the el. l., placed on the veins; stig. inconspicuous; ren. st. almost filled up with dark grey. VI, VII.

Larva dark grey, with a purplish tint; the dorsal and subdorsal lines whitish, the intermediate space darker (*Hub.*) On various low plants. VIII—IV.

Brg.!! Brs.! Ct. Da. Ex. Ha. Hu.!! L.D. Lw. Ly. M.! Pl. Sc. St. Tn.! Wt. Wr. Y.

A. occulta. 2″—2″ 3‴. F.-w. grey; the base, hind-margin and cen. sh. dark grey; the lines pale grey; orb. st. large and conspicuous, whitish; ren. st. less distinct, filled up with dark grey; clav. st. distinct and sometimes whitish: h.-w. dark grey; fringes white. VII, VIII.

Larva black on the back, yellowish grey on the sides; dorsal and subdorsal lines yellowish white; spots whitish (*Hub.*) On dandelion and other low plants. IV, V.

Bi. Ed. L.D. *Lw.* M. Tn. Y.

A. NEBULOSA. 1″ 1‴—2″ 2‴. F.-w. pale grey, almost whitish; transverse lines indistinctly darker; the cen. sh. forms between the stig. a dark grey blotch; a dark grey spot near the inner margin precedes the subt. l., which is there much angulated; orb. and ren. st. both large and pale; clav. st. distinct, but rounded. VI, VII.

Larva pale brown; dorsal line whitish, running in the centre of a row of dark brown lozenge-shaped spots, of which the anterior half is the paler; spiracular line edged above with blackish (*Boisdv.*) On dock and other low plants. IV, V.

Common everywhere; frequently abundant.

A. TINCTA. 1″ 11‴—2″. F.-w. SILVERY GREY, with slight rosy tinge towards the costa and hind-margin; a reddish brown streak on the inner margin precedes the subt. l., which is there NEARLY STRAIGHT; a similar blotch lies nearly before the middle of the subt. l. (the 3 stig. are all distinct, but smaller and neater than in *A. nebulosa*). VI, VII.

Larva dull greyish brown; the dorsal and subdorsal lines whitish; a dark stripe on each side of the dorsal line (*Freyer*). On grass and other low plants; also on birch. IV, V.

Pl. Tn. Wr. Birch and Darenth Woods.

A. ADVENA. 1″ 8‴—1″ 11‴. F.-w. PALE BROWN with a very faint pale rosy tint; orb. and ren. st. paler, hinder margin of ren. st. especially; the whitish subt. l. is ANGULATED near the inner margin, where it is preceded by a small brown spot. VI, VII.

Larva pale greyish brown; dorsal line pale; the edges of a series of lozenge-shaped spots along the back are dark brown, and a similar zigzag line runs below the subdorsal line; spots black (*Boisdv.*) On various low plants. III, IV?

Brg. Brs.! *Ca.!!* Ct.! Da. Ed.!! Ha.! K. L.D.! Lw. Ly. Tn. W. Y.!

Comes very freely to flowers.

Genus 13. Hadena.

Imago: antennæ pubescent, rarely pectinated in male; abdomen often crested, robust in female; fore-wings thick, dentate or subdentate, rather narrow, often with the 3 stig. distinct, sometimes with a forked pale spot beneath the ren. st.; subt. l. distinct, forming a W in its middle.

Larva smooth, elongate, not flattened, cylindric, rather brightly coloured; living on trees or low plants.

Pupa subterranean.

A. F.-w. with a central flesh-coloured spot. *H. Atriplicis.*
AA. F.-w. without any flesh-coloured central spot.
  B. A dark streak from the middle of base of f.-w., the space between it and the costa being pale.
    C. El. l. conspicuously whitish towards inner margin, and not indented. *H. rectilinea.*
    CC. El. l. not conspicuously whitish, and indented.
      D. From the clav. st. a dark dash proceeds to the el. l.
        E. Subt. l. pale grey. *H. W-latinum.*
        EE. Subt. l. yellowish.
          F. A paler band between the el. l. and subt. l. *H. contigua.*
          FF. Space between el. l. and subt. l. of the dark ground-colour. *H. thalassina.*
      DD. From the clav. st. no dark streak proceeds to the el. l. *H. suasa.*
  BB. No dark streak from base of f.-w., nor any pale basal costal blotch.
    G. F.-w. brownish red.
      H. Subt. l. slender, whitish, and with a distinct W. *H. oleracea.*
      HH. Subt. l. broad and pale yellow; W indistinct. *H. pisi.*
    GG. F.-w. brown, with a faint reddish tinge.
      I. Ren. st. and subt. l. pale reddish brown. *H. assimilis.*
      II. Ren. st. and subt. l. greyish. *H. adusta.*

III. A conspicuous large black blotch below the stig. *H. satura.*

GGG. F.-w. grey.

K. F.-w. with more or less of a greenish tinge. *H. protea.*

KK. F.-w. with no greenish tinge.

L. The three stig. pale. *H. glauca.*

LL. The two stig. and blotch beneath them pale. *H. dentina.*

LLL. None of the stig. pale. *H. Chenopodii.*

H. SATURA. 1″ 1‴—2″. F.-w. dark reddish brown; the lines and stig. paler; A CONSPICUOUS BLACK BLOTCH BELOW THE STIG., and a smaller black blotch at the base of the inner margin; beyond the subt. l. are a few black spots. VIII.

Larva reddish brown, with numerous short grey streaks; the dorsal and subdorsal lines pale greyish; the spiracular line and belly yellowish; the incisions of the seg. flesh-coloured (*Freyer*). On honeysuckle. VI.

Two specimens only have occurred, one in Oxfordshire and one in Cambridgeshire.

H. ASSIMILIS. 1″ 7‴—1″ 8‴. F.-w. dark reddish brown, almost black; the lines and stig. paler, hinder half of ren. st. conspicuously so; beyond the el. l. is a row of whitish dots: h.-w. GREY, with reddish ochreous fringes. VII.

LARVA UNKNOWN.

Rannoch, Perthshire, and Isle of Arran.

H. ADUSTA. 1″ 7‴—1″ 10‴. F.-w. pale brown, with darker blotches, one at the base along inner margin, and one along the fold between the i. l. and el. l.; the stig. pale brown; HINDER EDGE OF REN. ST. OFTEN WHITISH; the yellowish subt. l. is frequently preceded by a row of wedge-shaped dark spots: h.-w. WHITISH, with margins, veins, and central spot brownish. VI, VII.

Larva dull reddish, marbled with green on the back (beneath entirely green); dorsal line indicated by dark blotches at the

junction of the seg.; spiracular line whitish. On various low plants. VII, VIII.

Bi.! Brg.! Brs. Bu.! Ca.! Ct. Da. Ed.! Ha.! Hu. L.D.! Lw. M.! Sc. St. Y.!

H. PROTEA. 1″ 3‴—1″ 4‴. F.-w. dull greenish, more or less marbled with white or rosy; the stig. generally conspicuously paler, and a pale blotch obliquely beneath the orb. st.; the most distinct line is the subt. l., which is generally whitish. IX.

Larva green; the dorsal and spiracular lines and the incisions of the seg. whitish (*Hub.*) On oak. VI.

Common everywhere.

H. GLAUCA. 1″ 4‴—1″ 6‴. F.-w. grey; the 3 stig. conspicuously paler; the first 3 lines rather indistinct; the subt. l. distinct, yellowish white, and not sharply angulated at the inner margin, preceded by a row of wedge-shaped blackish spots. VI.

Larva reddish ochreous, marbled with blackish on the back; subdorsal line black, slightly interrupted; spiracular line dark grey; the spiracles and six dots on the top of 2nd seg. white (*Hub.*) On coltsfolt? VII, VIII.

Ed. Hu. L.D. M.! Sh. St.

H. DENTINA. 1″ 3‴—1″ 5‴. F.-w. pale grey, with a faint yellowish tinge; space between the i. l. and el. l. dark greyish brown, excepting the 2 stig., the vein on which they rest, and sometimes a blotch beneath it, which are pale whitish grey; before the subt. l. is a rather distinct pale band. VI, VII.

Larva dull olive-grey, brownish along the back, with a row of triangular black spots above the subdorsal line; head reddish brown (*Hub.*) On dandelion and other low plants, preferring the roots. V? VI?

Common everywhere.

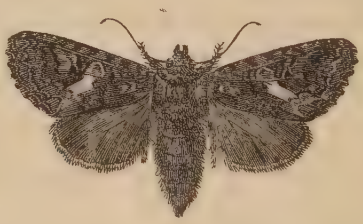
H. CHENOPODII. 1″ 5‴—1″ 6‴. F.-w. grey; the first 3 lines slightly paler; the subt. l. often conspicuously paler,

sometimes yellowish; orb. st. often with a pale margin; ren. st. with a dark grey blotch at the lower end. VI, VII.

Larva green; spiracular line red edged with white; subdorsal line sometimes blackish, often of the ground-colour (*Boisdv.*) V? and IX. On goosefoot (*Chenopodium*) and orach (*Atriplex*).

Brg.! Brs. Ca. Ex. K. Lw. Sh. Wa. Wr.

H. Atriplicis. 1″ 8‴—1″ 11‴. F.-w. greenish grey; ren. st. of an enormous size, containing within it a slender white streak; BENEATH IT IS A CONSPICUOUS PALE FLESH-COLOURED OBLIQUE BLOTCH; the subt. l. very distinct and whitish. VI.



Larva dull greenish brown; dorsal line black; spiracular line broad, pale reddish; spiracles white (*Boisdv.*) VIII, IX. On dock, goosefoot, *Persicaria*, &c.

Ca.!! *M.*

H. suasa. 1″ 5‴—1″ 8‴. F.-w. pale brown; the hind-margin dark brown; subt. l. conspicuously yellowish white, much indented in the middle; a short black streak near the middle of the base; orb. st. of the ground-colour; lower half of ren. st. darker; clav. st. dark brown. VI.

Larva flesh-colour dotted with yellowish; the dorsal and subdorsal lines bluish; the spiracular line yellow (*Dup.*) On various low plants. VII—X.

Bi. *Brs.* Bu. Ca.! M.! Sh. St. Tn. Y.

H. OLERACEA. 1″ 5‴—1″ 7‴. F.-w. DULL DARK RED; REN. ST. DEEP ORANGE; subt. l. whitish; the other lines and orb. st. indistinct. VI.

Larva ochreous-brown dotted with white; dorsal line brown: subdorsal line pale; spiracular line bright yellow, edged above with blackish. On various low plants. VIII, IX.

Common everywhere.

H. PISI. 1″ 5‴—1″ 7‴. F.-w. pale reddish brown marbled with darker; THE CONSPICUOUS SUBT. L. PALE YELLOWISH, RATHER BROAD TOWARDS INNER MARGIN, and sharply angulated there; the stig. are rarely paler than the ground-colour. VI.

Larva dark green (or reddish brown); subdorsal and spiracular lines yellow. On broom and various plants. VIII—X.

Bi. Brg. Brs.! Bu.! Ca.! Ct.! Da. Ed.! Ha. K. L.D.! Lw. M.! Pl. Sc.! Wa.! Wr. Y.

H. THALASSINA. 1″ 6‴—1″ 9‴. F.-w. pale brown varied with darker; ORB. ST. AND A PALE BLOTCH AT THE BASE OF COSTA OCHREOUS-GREY; beneath this blotch is a black streak from the base; subt. l. pale ochreous, sharply angulated in the middle, but not on the inner margin. VI, VII.

Larva pale green; dorsal line darker; oblique reddish streaks meet it at the end of each seg.; subdorsal and spiracular lines reddish, interrupted (*Freyer*). On broom, honeysuckle, &c. VIII, IX.

Common everywhere.

H. CONTIGUA. 1″ 5‴—1″ 6‴. F.-w. pale grey marbled with darker; a small blotch at the base of the costa pale ochreous-grey; subt. l. yellowish, sharply indented, preceded by a pale band, the lower portion of which is conspicuously whitish grey; THE WHITISH ORB. ST., A PALE BLOTCH OBLIQUELY BELOW IT, AND THE LOWER END OF THIS BAND, FORM A PALE OBLIQUE STREAK. VI.

Larva yellowish green; subdorsal line indicated by a row of

oblique reddish brown streaks; spots reddish brown (*Boisdv.*) On nut, and various bushes and plants. VIII, IX.
Ct. Lw. Ly.

H. W-LATINUM. 1″ 7‴—1″ 9‴. F.-w. PALE GREY, with a slight purplish tint; A STOUT BLACK LINE from the middle of the base; above it a pale ochreous blotch on the costa; the stig. ochreous; THE ORB. ST. LARGE AND ROUND; between and below the stig. is a dark reddish brown blotch; lower half of i. l. and el. l. whitish; subt. l. pale grey, much indented, preceded by a reddish line. V e, VI.

Larva brownish, anteriorly with a greenish, posteriorly with a rosy tinge; dorsal line slightly darker; spiracular darker, edged beneath with whitish; subdorsal line indicated by some sloping dark lines. VII—IX.
Brg. Brs. Ct. Lw. Ly.

H. RECTILINEA. 1″ 6‴—1″ 7‴. F.-w. PALE GREY; the space between the i. l. and el. l. dark reddish brown; THE ORB. ST. SMALL, ALMOST LINEAR; a thick black dash from the middle of the base; LOWER HALF OF EL. L. WHITE. VI.

Larva brown or reddish ochreous, with the spots and spiracles white, and a row of oblique dark streaks meeting the dorsal line (*Hub.*) On bilberry (*Vaccinium*), bramble, &c. IX.
Hu.; near Sheffield; Torwood, Stirlingshire; and Rannoch, Perthshire.

Family VIII. XYLINIDÆ.

Imago: antennæ generally simple; thorax robust; collar often crested; wings oblong, with longitudinal markings; the ordinary lines rarely distinct. Wings folded in repose, forming a flattened roof, and giving the insect an elongate appearance.

Larva cylindrical, elongate, smooth, generally of brilliant colours; living exposed on low plants or trees, of which they eat the flowers or leaves.

Pupa often furnished with projecting ventral appendages; enclosed in cocoons of variable consistence, either subterranean or above ground.

This is a Family of small extent, comprising with us only seventeen species, divided into six genera, two of which, *Calocampa* and *Cucullia*, are among the best-defined genera we have among the NOCTUINA. The species of *Cucullia* are best obtained by collecting the larvæ; these are always brilliant, and seek no concealment, feeding on the flowers and seeds of various plants. *C. Gnaphalii* is the only species that is still a rarity with us, unless *Scrophulariæ* may be also considered rare. All are more or less local, except *C. Verbasci* and *C. umbratica*, which the young collector will be sure to find his first season, the former as a larva on the woolly leaves of the mullein, the latter in the perfect state hovering (almost like a *Sphinx*) at flowers at dusk, or at rest on palings by day. The *Xylinæ* are all local, but not uncommon at sugar and ivy-bloom. The Sword-grasses (*Calocampa exoleta* and *vetusta*) are now no rarities, and are obtained by sugaring in autumn and spring. Most beginners will find *Xylocampa lithorhiza* sitting on palings the first April they look for it. *Cloantha perspicillaris* is one of our rarities, only two specimens being on record. *Calophasia Linariæ* has not occurred since 1817, and its occurrence then is by some considered doubtful. Common throughout Europe, it probably needs but to be well looked for; and from the habit of the larva of stripping the stems of the *Linaria* (toadflax) it does not require a very close scrutiny to detect its presence.

Genus 1. Xylocampa.

Imago: antennæ velvety, not ciliated, with a tuft of hair at the base; abdomen long, thick, hairy, crested on the anterior segments; fore-wings rather oblong, with long fringe and distinct spots.

Larva very elongated, much attenuated at each end, swollen in the middle, with an eminence on the 12th segment; feeding exposed on honeysuckle.

Pupa enclosed in a papyratious cocoon, placed on the surface of the ground.

X. lithorhiza. 1″ 4‴—1″ 5‴. F.-w. pale grey with a faint rosy tinge; a black streak from the middle of the base to the i. l.; the stig. distinct; a prolongation from the lower end of the orb. st. running into the ren. st.; before the subt. l. is a row of black dashes. III e—IV.

Larva greyish ochreous; dorsal line paler, enclosed in a series of brownish lozenge-shaped spots, that on the 8th seg. most conspicuous; spots white edged with black; 12th seg. with a slight hump (*Gu.*) On honeysuckle. VII, VIII.

Bi.! Brs. Ca.! Da.! Ex.! K. L.D. Lw. Ly. M.! Sc.! Sh.! St.! Tn. Wa.! Wt. Wr. Y.

Genus 2. Cloantha.

Imago: antennæ pubescent in male; thorax with the collar not forming a hood; abdomen not depressed, slightly crested; fore-wings moderately elongate, with the fringe rather dentate, with streaky markings, and the ren. st. distinct.

Larva cylindrical, thick; spiracular line very distinct. Living on low plants, and concealed during the day.

Pupa with no ventral appendage, subterranean.

C. perspicillaris. 1″ 4‴. F.-w. varied with pale ochreous, brownish green and rosy; a long black line from the middle of the base; the transverse lines unrepresented; ren. st. alone visible; a row of wedge-shaped black dashes along the hind-margin. V.

Larva reddish brown dotted with dark brown; dorsal line narrow, yellow; a row of oblique brownish streaks on the back, rather indistinct: spiracular line pale yellow, edged with dark brown (*Gn.*) On St. John's-wort (*Hypericum*). VII, VIII.

One at Yarmouth, in 1841; one at Ashford, Hants, in a spider's web.

C. Solidaginis. 1″ 7‴—1″ 9‴. F.-w. pale grey with a slaty tinge; the i. l. and el. l. much indented, the space between them dark grey; ren. st. white; two or three wedge-shaped black streaks precede the subt. l. VIII.

Larva dark reddish brown, with the slender dorsal line, broad spiracular line (bordered with blackish brown), and dorsal spots pale yellow, the latter placed on a row of blackish blotches (*Hub.*) On bilberry (*Vaccinium*). VI.

M.! The great locality for this is "The Brushes," near Manchester. It occurs in Scotland, but not abundantly.

Genus 3. Calocampa.

Imago: antennæ long, slightly ciliated in male; abdomen much flattened, smooth, hairy at the sides; fore-wings very oblong, the edges nearly parallel, dentate, with streaky markings and distinct spots; in repose they are puckered and crossed, and give the insect a very elongate form.

Larva very long, cylindrical, attenuated at each end; feeding on low plants, and excessively beautiful.

Pupa subterranean, buried to a considerable depth.

We have two species in the genus, readily distinguished by the characters emphasised.

Any one who has not yet seen the larva of *Exoleta* has a treat in store. I have only once seen it, and then I nearly screamed with delight. No figure can give any idea of the beauty of the living larva.

C. VETUSTA (Red Sword-grass). 2″ — 2″ 3‴. F.-w. ochreous; ALONG THE INNER MARGIN RUNS A BROAD RED-BROWN STRIPE; ORB. ST. VERY INDISTINCT, OBLIQUELY placed, and with A FEW dark spots in it; FROM THE REN. ST. a black dash runs to the subt. l. IX, X; III h, IV h.

Larva dark green, with the subdorsal line pale yellow; the slender yellow spiracular line edged with black; spiracles yellow; spots white, edged with black (*Gu.*) On various meadow-plants and marsh-plants. V, VI.

Bi. Brg.! *Brs.* Bu. Ca. Ct. Ed. Hu. L.D. Lw. M. Sc. Sh. Tn. Wt. Y.

C. EXOLETA (Sword-grass). 2″ 2‴ — 2″ 4‴. F.-w. GREYISH ochreous, reddish ochreous towards the costa and hind-margin; ORB. ST. RATHER DISTINCT, nearly STRAIGHT, and FILLED UP with dark grey; a short black dash precedes the subt. l., but does NOT REACH NEARLY TO THE REN. ST. IX, X; III h, IV h.

Larva bright green; the subdorsal and spiracular lines pale yellow, the latter intersected by a slender scarlet streak; spots white, edged with black; the dorsal spots connected by a black blotch (*Boisdv.*) On various plants. VI, VII.

Bi.! Brg.! Brs.! Bu.! Ca. Ct. Da.! Ed.! Ex. Hu.! K. L.D.! Lw. Ly. M.! Pl.! Sc.!! Sh. Wt. Wr. Y.

Genus 4. XYLINA.

Imago: antennæ slightly ciliated in male; abdomen depressed, sometimes crested; fore-wings narrow, elongate, the edges nearly parallel.

Larva rather short, soft, with all the lines distinct; feeding exposed on trees.

Pupa subterranean.

We have three species, thus distinguished:—

A. Fore-wings pale grey. *X. rhizolitha.*

AA. Fore-wings ochreous or brown.

B. A blackish blotch near anal angle of fore-wings. *X. semibrunnea.*

BB. No blackish blotch near anal angle of fore-wings. *X. petrificata.*

X. RHIZOLITHA. 1″ 6‴—1″ 7‴. F.-w. GREYISH WHITE, WITH A TRIFURCATE BLACK DASH FROM THE MIDDLE OF THE BASE; a short line on the fold below the stig. and the lower edge of the ren. st. are also sometimes black. IX, X; III h, IV h.

Larva bluish green dotted with white; dorsal and subdorsal lines white, rather indistinct; spiracular line yellowish white (*Boisdv.*) On oak. V.

Brg.! Brs.! Ca. Ct.! Ex. Ha.! K. Lw. Ly. Pl.! Sh. St.! Tn. Wt. Wr. Y.

X. SEMIBRUNNEA. 1″ 6‴—1″ 8‴. F.-w. brown, darker towards the inner margin; between the el. l. and subt. l. is an OVAL BLACKISH BLOTCH near the inner margin. IX, X.

LARVA UNKNOWN.

Brs.! Ca. Ct. K. Ly. Pl. Wr.

X. PETRIFICATA. 1″ 6‴—1″ 8‴. F.-w. ochreous slightly tinged with grey; a darker blotch between and below the stig., but not with the dark blotch between the el. l. and subt. l. which is so characteristic of *Semibrunnea.* IX, X.

Larva pale green, with white dorsal and lateral lines; head and legs black; prolegs green (*Parfitt in litt.*) On oak, lime, &c. V—VII.

Brs.! Ex. L.D. Ly. Wr.

Genus 5. Cucullia.

Imago: antennæ entirely smooth in both sexes; thorax robust; collar well developed, and raised in the form of a hood; abdomen conical, not flattened, much longer than the hind-wings; fore-wings long, narrow-lanceolate, in repose covering the much shorter hind-wings, and forming a very inclined roof.

Larva long, firm, with the skin thick and shining; feeding exposed on low plants, of which they prefer the flowers.

Pupa soft, with a ventral projection; subterranean, enclosed in large oval cocoons.

We have eight species in this genus, which may be readily divided into groups.

A. Fore-wings ochreous, with the costa and inner margin darker. *C. Verbasci*, *Scrophulariæ* and *Lychnitis*.

AA. Fore-wings grey, with darker inner margin, or with distinct dark i. l. *C. Asteris*, *Gnaphalii* and *Absinthii*.

AAA. Fore-wings grey, with numerous longitudinal darker lines. *C. Chamomillæ* and *umbratica*.

Of the first three species, *Lychnitis* is most readily distinguished by its small size, paler ground-colour, narrower and darker costal stripe. *Verbasci* and *Scrophulariæ* are very difficult to distinguish in the perfect state.

The three species of the second group present no difficulty; the black transverse i. l. in *Absinthii* separates it at a glance from the other two; *Asteris* is known by its dark costa, *Gnaphalii* by its broad central band.

In the third group *Chamomillæ* is at once separated from *Umbratica* by its darker ground-colour, and by the black dashes in the fringes.

The long pointed wings, elongate bodies and hooded thorax of these insects enable the merest tyro readily to recognise a "Shark" the first time he meets with one; and the beauty of

the larvæ (though nothing in comparison with that of a *Calocampa* larva), and the ease with which they may be picked off the flowers and leaves of the plants on which they feed, is also a noticeable trait in their character.

C. Verbasci. 1″ 9‴—1″ 10‴. F.-w. greyish ochreous, with a red-brown stripe along the costa and inner margin; the el. l. forms 2 whitish crescents in the stripe on the inner margin. IV e, V.

Larva greenish white, with a rather broad, bright yellow, transverse band on each seg. reaching from spiracle to spiracle; in this are placed the ordinary spots, which are black and very large; a pair of large black spots on each seg. are nearly in the subdorsal line: a black spot follows each spiracle, and two are below it; the upper part of the proleg is black; face yellowish, spotted with blue.

Brg.! Brs.! *Ca.!!* Ex. Lw.! Pl.!! St.! Wa.! Wr.

C. Scrophulariæ. 1″ 8‴—1″ 9‴. F.-w. pale ochreous, with a black-brown stripe along the costa and inner margin, only with a red-brown tendency beyond the middle; the el. l. forms two whitish crescents in the stripe on the inner margin. V.

Larva greenish white; a yellow band on the back of each seg.; dorsal black spots large and almost always united; (lateral spots similar to those in *C. Verbasci*); prolegs yellow, not with a black spot; face yellow (*Rambur*). On *Scrophularia nodosa* and *aquatica*, *Verbascum Blattaria*. VI, VII.

Ca.!! Ex. Pl.

C. Lychnitis. 1″ 6‴. F.-w. pale ochreous; a narrow stripe along the costa dark brown, and a narrow stripe along the inner margin blackish; this last is interrupted by the two pale crescents at the lower end of the el. l., and contains a pale blotch at the anal angle. VI, VII.

Larva pale dull yellowish white or greenish white; on each seg. a deep yellow band, with two black spots in front and a curved black band behind; behind each spiracle is a black

spot and another below it, and two spots obliquely below them; prolegs not spotted with black; face yellow spotted with black. VIII, IX.

Marlow and Arundel.

C. Asteris. 1″ 8‴—1″ 10‴. F.-w. SLATY GREY, shading into brown along the costa, and with a brown-black stripe along the inner margin, intersected by ONE WHITE CRESCENT in the el. l.; stig. faintly indicated, rather of an ochreous tinge. V e, VI.

Larva bluish green or purplish, with yellow dorsa and subdorsal lines and white spiracular line, each of these edged more or less distinctly with blackish (*Hub.*) On golden-rod (*Solidago virgaurea*). VIII, IX.

Brg. Lw. West Wickham.

C. Gnaphalii. 1″ 6‴. F.-w. pale grey, with a delicate rosy tinge; A BROAD DARK BROWNISH BAND BETWEEN THE I. L. AND EL. L.; orb. st. greyish ochreous and well-defined; ren. st. pale grey, hardly defined externally; the el. l. forms a white crescent near the subt. l. VI.

Larva pale green; the back dull reddish, with a broad paler dorsal line edged with brownish; a row of dull red blotches along the spiracles (*Boisd.*) On golden-rod (*Solidago virgaurea*). VII, VIII.

Lw. Darenth Wood and Horndean; scarce.

C. Absinthii. 1″ 6‴—1″ 7‴. F.-w. pale grey; THE I. L. REPRESENTED BY A DOUBLE BLACK TRANSVERSE LINE;

black dots indicate the margins of the stig.; between them is an oblong black spot. VII.

Larva green, with a row of pale green blotches along the back; dorsal spots pale yellow; subdorsal line white, and from it on each seg. a white oblique streak to the belly; a row of pale greyish red blotches along the spiracles (*Freyer*). On wormwood (*Artemisia*). VIII, IX.

Plymouth.

C. Chamomillæ. 1″ 9‴—1″ 10‴. F.-w. brownish grey, with a slight reddish tinge towards the costa, with a black line from the middle of the base, and numerous short dark longitudinal lines; the black lines along the hind-margin intersect the fringes: h.-w. brownish, paler towards the base. V e, VI.

Larva pale straw-yellow, with a rosy transverse band on each seg.; dorsal line dull olive-green; subdorsal line of the same colour, but wavy and interrupted (*Boisdv.*) On chamomile (*Matricaria* and *Anthemis*). VII, VIII.

Ed. K. Lw. M. Pl. *Wt. Y.*

C. umbratica. 1″ 11‴—2″ 1‴. F.-w. pale grey, with a black line from the middle of the base, and numerous short black longitudinal lines; fringes not intersected: h.-w. (of ♂) whitish, with brown veins, (of ♀ pale brownish grey, paler at the base). VI.

Larva blackish, with a row of orange blotches (two on each seg.) along the back, and a row of smaller orange blotches along the spiracles (*Hub.*) On sow-thistles (*Sonchus oleraceus* and *arvensis*). It hides by day under the lower leaves. VII—IX.

Common everywhere.

Genus 6. Calophasia.

Imago: antennæ filiform, not ciliated; abdomen hairy, a little depressed, not crested; fore-wings with the lines partly obliterated, and only visible towards the inner margin when they approximate.

Larva rather elongate, attenuated at each end, yellow,

strongly marked with black spots; feeding exposed upon *Linaria*.

Pupa short, with a long, filiform, ventral projection; enclosed in a pear-shaped papyratious cocoon, attached to the stem of the plant and mixed with rubbish.

C. Linariæ. 1″ 2‴—1″ 3‴. F.-w. pale grey clouded with brown; the stig. whitish; the i. l. and el. l. almost meet on the inner margin; some black dashes precede and follow the subt. l. V e.

Larva pale bluish grey dotted and spotted with black; the dorsal, subdorsal and spiracular lines yellow (*Gu.*) On toad-flax (*Linaria vulgaris*). VI e, VII.

In 1817 the late Mr. Stephens received specimens from Woodside, near Epping (*Ill. H.* iii. 94).

Family X. HELIOTHIDÆ.

Imago of moderate or small size; the antennæ not pectinated, the thorax stout, the abdomen smooth; flight often diurnal.

Larva cylindrical, not attenuated; feeding exposed on low plants, often preferring the flowers.

Pupa with the abdominal portion conical, enclosed in cocoons of little solidity.

This Family is of small extent, comprising only ten British species; many of them are rare. The larvæ are generally very beautiful, in that respect resembling those of the preceding Family; and their exposed mode of feeding on the flowers and seeds reminds one of *Cucullia*.

Most of the species fly briskly during the hottest sunshine; some few also fly at dusk.

The two commonest species of the Family are *Anarta Myrtilli* and *Heliodes heliaca*; the former may be found on almost

every heath in summer, the latter in meadows from the middle to the end of May. These species the young collector may expect to meet with his first season; but in order to catch *Myrtilli* he must profit by the directions given in Shield's 'Practical Hints,' and not hastily pursue, at full speed, each flying specimen, but take a well-selected situation, and catch those that fly past. We speak on this point from experience, having had many a tumble and narrow escape of being bogged for want of a little advice as to the proper mode of capturing *Myrtilli*. *Arbuti* may often be found asleep on the flowers in grass fields after the heat of the day is over, for during the bright sun it flies gently. The insect might readily be passed over as one of the *Micro-Lepidoptera*, but is nevertheless a veritable *Noctua*. Two species of *Anarta* are not uncommon in the North of Perthshire, viz., *Melanopa* and *Cordigera*, but are not very likely to be met with further South. Two of the genus *Heliothis* (*dipsacea* and *marginata*) are not very uncommon; but it certainly may be years before the tyro meets with them. *Heliothis peltigera*, *armigera*, *scutosa*, and *Chariclea Delphinii* are all very rare; and those are indeed lucky who have taken any of these species.

This Family comprises four genera, which may be thus classified :—

A. Hind-wings yellow or white, with black border.
  B. Body stoutish. Genus 3. ANARTA.
  BB. Body slender. Genus 4. HELIODES.
AA. Hind-wings not yellow, sometimes whitish, with dark grey border.
  C. Fore-wings rosy grey. Genus 1. CHARICLEA.
  CC. Fore-wings ochreous or brownish ochreous, or white and black. Genus 2. HELIOTHIS.

Genus 1. Chariclea.

Imago: antennæ slightly pubescent in male; thorax hairy, crested, with the collar a little raised; abdomen with a crest on the first seg.; fore-wings acute and subfalcate at the tip, with distinct lines and spots.

Larva smooth, cylindrical, of lively colours; feeding on the seeds of larkspur (*Delphinium*).

Pupa subterranean, a little attenuated in front; enclosed in a slight cocoon.

We have only one species, which some are disposed to think not truly indigenous. It is common in central Europe.

C. Delphinii (Pease-blossom). 1″ 3‴—1″ 4‴. F.-w. pale greyish ochreous with a rosy tinge; the space between the base and i. l. darker dull reddish; orb. st. indistinct; ren. st. dark grey, rather flattened; a reddish grey band beyond the el. l.

Larva reddish white or bluish white; dorsal line black; the spots large, bluish black; subdorsal line pale yellow; spiracular line white (*Gu.*) On larkspur (*Delphinium*). VII. (The larva is gregarious when young).

Has occurred near Windsor.

Genus 2. Heliothis.

Imago: antennæ of the male pubescent; thorax smooth; abdomen rather depressed, smooth; fore-wings slightly acute at the tip; the ren. st. more or less black.

Larva elongate, not attenuated, rather shining, with distinct lines; the head large. Feeding exposed on low plants, preferring the flowers.

Pupa subterranean, conical.

We have five species, which may be easily recognised as follows. They fly briskly by day, and also at dusk.

A. Dark border of h.-w. with no pale blotch. *H. marginata.*
AA. Dark border of h.-w. with a pale blotch.

B. H.-w. with a broad black central lunule.
C. H.-w. with a transverse black line before the dark border. *H. scutosa.*
CC. H.-w. with no transverse black line before the dark border. *H. dipsacea.*
BB. H.-w. with a narrow greyish central lunule.
D. F.-w. with a black dot at anal angle. *H. peltigera.*
DD. F.-w. with no black dot at anal angle. *H. armigera.*

H. MARGINATA. 1″ 2‴—1″ 4‴. F.-w. pale brownish ochreous, WITH A PURPLE TINGE BEYOND THE EL. L.; all the lines and cen. sh. distinct; both the stig. distinctly outlined; the ren. st. slightly filled up with grey: h.-w. whitish ochreous, with a broad blackish border and central lunule. V e, VI.

Larva green, dotted with whitish; dorsal line dark green, bordered with whitish; subdorsal line whitish green; spiracular line yellow (a reddish grey variety is not uncommon)—(*Boisdv.*) On rest-harrow. VII, VIII.

Bi. Ca.! Ct.! Lw. Wt. Wr.

H. PELTIGERA. 1″ 3‴—1″ 5‴. F.-w. greyish ochreous more or less tinged with brown; ORB. ST. INVISIBLE; ren. st. dark brown, UNITED WITH THE COSTA BY A BLOTCH; a dark costal blotch at the commencement of the subt. l.; A SMALL BLACK DOT AT THE ANAL ANGLE. VI.

Larva green; dorsal line blackish, interrupted in the middle of each seg.; subdorsal line pale green; spiracular line white; (a variety occurs with a transverse ochreous band on each seg.)—(*Boisdv.*) On *Hyoscyamus*, rest-harrow, and *Arenaria*. VII, VIII.

Ca. Ct. M. Pl.

H. ARMIGERA. 1″ 5‴—1″ 7‴. F.-w. brownish ochreous; THE ORB. ST. VISIBLE as a small dot; the ren. st. dark grey; a dark indistinct band beyond the el. l.; NO black dot at anal angle. VIII—X.

Larva reddish brown; dorsal line streaked with yellow and black; spiracular line similar; the spots distinct and black (*Freyer*). On wild mignonette (*Reseda lutea*). VI, VII.
Ca. L.D. M.

H. DIPSACEA. 1″ 3‴—1″ 4‴. F.-w. greyish ochreous WITH A SLIGHT GREENISH TINGE; a dark central band includes the ren. st., which is dark grey; a dark band beyond the el. l. joined to the central band on the inner margin, and a row of black dots on the hind-margin: h.-w. whitish, with a broad blackish border (CONTAINING A DISTINCT WHITISH BLOTCH), and broad black central lunule. VII.
Larva straw-yellow streaked with reddish brown; dorsal line broad, violet-brown; a violet-brown stripe below the subdorsal line; a reddish transverse band on each seg.; spots small and black (*Gu.*) On numerous low plants, especially *Linaria*. VIII, IX.
Ca. Wr. Y.

H. SCUTOSA. 1″ 4‴. F.-w. WHITISH, WITH NUMEROUS BLACKISH MARKINGS; the orb. st. and a large spot below it are brownish black; ren. st. is blackish; beyond the el. l. is a blackish band, intersected by the whitish veins; hind-margin brown, with a row of black dots: h.-w. whitish, with a broad ill-defined border containing TWO whitish blotches; a broad central lunule; A TRANSVERSE LINE BEYOND IT and the veins blackish. VIII or VI.
Larva yellowish green, with the spots and several lines greyish black (*Freyer*). On *Artemisia campestris*. VII.
Near Carlisle.

Genus 3. ANARTA.

Imago rather small; antennæ slender, velvety or slightly pubescent in both sexes; head small, sunk in the thorax; thorax short, clothed with long hair-like scales; fore-wings thick, velvety, with confused markings; hind-wings yellow or white, with black margin.
Larva short, smooth; feeding exposed on heath, bilberry,

&c.; in repose with the anterior portion of the body bent under.

Pupa enclosed in a cocoon of silk mixed with earth.

These pretty little insects fly by day, most briskly in the hottest sunshine. We have three species, which may be thus recognised. (Several other species occur in Lapland; and we should not be surprised if the North of Scotland, Sutherlandshire or Caithness were yet to add to our lists in this genus).

A. H.-w. white. *A. melanopa.*
AA. H.-w. yellow.
B. Ren. st. white. *A. cordigera.*
BB. A white blotch beyond the orb. st. *A. Myrtilli.*

A. MELANOPA. 1″—1″ 3‴. F.-w. grey; the stig. dark grey; the lines black: H.-W. WHITE, with broad black border and central lunule. VI.

LARVA UNKNOWN.

Rannoch, Perthshire.

A. CORDIGERA. 11‴—1″. F.-w. GREY; space between the i. l. and el. l. dark grey; REN. ST. WHITE: h.-w. yellow, with rather narrow black border. V.

Larva reddish ochreous; dorsal line brownish ochreous, with an oblique brownish streak meeting it on each seg.; spiracular line whitish anteriorly; spots and spiracles white (*Hub.*) On *Vaccinium.* VIII.

Rannoch, Perthshire. Sometimes found at rest on granite rocks.

A. MYRTILLI (Beautiful Yellow Underwing). 11‴—1″. F.-w. DULL RED; the lines whitish; the subt. l. most distinct; IMMEDIATELY BEYOND THE ORB. ST. IS A WHITE BLOTCH: h.-w. bright yellow, with a broad, deep, black border. VI, VII.

Larva beautiful green; the

lines darker, insersected by a series of yellowish white blotches; spots and spiracles white (*Hub.*) On heath (*Calluna vulgaris*). IX, X.

Bi.! Da.! Ed. Hu.!! L.D.!! Lw.! Ly. M.! Sc.!! Sh. Tn. Wa.! Y.!!

Genus 4. Heliodes.

Imago: antennæ short, not pubescent; head small, but not sunk in the thorax; abdomen very slender; fore-wings broad, slender, acute at the tip; hind-wings broad, yellow, with a black border. In repose the wings form a very flat roof, hardly sloping.

Larva short, thick; the head small. Feeding on the flowers and green seeds of *Cerastium*.

Pupa short, thick, subterranean.

We have only one species.

H. Arbuti (Small Yellow Underwing). 9‴. F.-w. greyish brown, with a very faint purplish gloss; cen. sh. distinctly darker, and a dark band at the hind-margin: h.-w. deep yellow, with black border, and the base blackish. V m—VI b.

Larva pale green or greyish green; dorsal line darker, bordered with white; subdorsal line pale; spiracular line white (*Gu.*) On *Cerastium arvense*. VI.

Bi. Brs.! Bu.! Ct.! Da.! Ex.! Ha.! Hu.! L.D.! Lw. M.! Sh.! Tn. Wa.! Wr. Y.!

We now arrive at the third section of the Trifidæ, the Minores, the characters of which have already been given at page 172. The British species are only nine in number, but are distributed into four families.

It is not an easy matter to tabulate the families of this section; but the following is a rough approximation, applicable to our British species:—

A. Abdomen crested. 2. Erastridæ.
AA. Abdomen not crested.
B. Abdomen downy; hind-wings orange. 4. Phalænoidæ.
BB. Abdomen not downy, smooth; hind-wings not orange.
C. Fore-wings with a white transverse line towards the hind-margin. 3. Anthophilidæ.
CC. Fore-wings with no white transverse lines. 1. Acontidæ.

Family I. ACONTIDÆ.

Imago: antennæ slender, simple in both sexes; abdomen smooth: fore-wings thick, rather shining, in repose covering the hind-wings, and forming a very sloping roof.

Larvæ slender, a little swollen posteriorly, with twelve legs; feeding exposed on *Convolvulus*.

Pupa subterranean.

The small extent of this Family, which comprises only two species, might appear to render any general remarks unnecessary; but the beauty of the perfect insects will not admit of their being passed over. *Acontia luctuosa*, which appears partial to chalk, will certainly be the first to gladden the eyes of the young collector. I once met with it between Croydon and Sanderstead; but near Brighton it appears not uncommon in some seasons. *Agrophila sulphuralis* used to be a great rarity; but a school-boy, spending his midsummer holidays at Brandon, in Suffolk, having taken it, this insect found its way into all our collections, and Mr. Dunning "awoke and found himself famous." I mention this as a hint to other school-boys. Since Mr. Dunning ceased to visit Brandon, *Sulphuralis* has been no more taken.

The Acontidæ fly briskly in the middle of the day during the hot sun. Our two species may be readily recognised.

A. F.-w. sulphur-yellow, with black streaks and spots. *Agrophila sulphuralis.*

AA. F.-w. blackish, with a cream-coloured costal blotch beyond the middle. *Acontia luctuosa.*

Genus 1. Agrophila.

Imago: abdomen smooth, banded; fore-wings rather elongate; hind-wings unicolorous above.

Larva slender, geometriform, with only twelve legs; in repose the anterior segments are bent under the middle segments, which are raised.

Pupa enclosed in an earthen cocoon.

A. sulphuralis. 10‴—11‴. F.-w. pale yellow, with 2 black streaks from the base, 1 along the inner margin and another along the centre of the wing; both these terminate in a blackish band beyond the middle; towards the costa are 5 or 6 black spots, and 3 or 4 towards the hind-margin sometimes united into a band. VI.

Larva green or reddish brown, dotted with black; spiracular line broad, pale yellow (*Hub.*) On *Convolvulus.* VII?

Ca. Brandon, in Suffolk, in 1845, 1846 and 1847.

Genus 2. Acontia.

Imago: abdomen smooth, slightly carinated; fore-wings marbled with black and white; hind-wings white, with black border, the hind-margin sinuous.

Larva long and slender, geometriform, with only twelve legs. (The larva, however, of the only British species is totally different from the other larvæ of this genus; it has sixteen legs, is moderately thick, and not the slightest geometri-

form appearance. Guenée remarks, "This curious exception is perfectly unique among the NOCTUÆ.")

Pupa enclosed in an earthen cocoon.

A. LUCTUOSA. 11‴—1″. F.-w. blackish, with the lines darker; A LARGE WHITE BLOTCH FROM THE COSTA BEYOND THE MIDDLE: h.-w. whitish, with a broad black border and blackish base. VI—VIII.

Larva (with sixteen legs) reddish grey streaked and marbled with brown; a black spot between the legs on the 5th, 6th, 7th and 8th seg. (*Gu.*) On *Convolvulus*. V, VI.

Brg. *Ca.* Ct. Lw.

Family II. ERASTRIDÆ.

Imago small; antennæ short, simple; abdomen slender, generally crested; fore-wings rather broad, often with the lines and stig. well marked; in repose they form a very flat roof.

Larva with fourteen legs, half-loopers; the first pair of ventral legs indistinct, a little swollen posteriorly.

Pupa enclosed in a cocoon on the surface of the earth.

This Family contains but three British species, divided into two genera. Only of these, *Erastria fuscula*, is not at all uncommon, frequenting woods. *Bankia Bankiana* is a local insect, and has occurred in a boggy place near Beachamwell, in Norfolk, and at Whittlesea Mere; it has also occurred in the South of Ireland. *Erastria venustula* is excessively rare. In 1830 Mr. Stephens says of it, in his 'Illustrations,' "An extremely rare species, of which I have hitherto seen four examples only;—a pair in my own cabinet; one of the latter taken, I believe, in Epping Forest, by the late Mr. Honey; the other by the late Mr. Bentley." And it was fifteen years after this before the insect was again seen. In the 'Zoologist' for 1845, at page 1085, we read the following note on this species by

Mr. Henry Doubleday:—"On the 29th of June, whilst walking with a friend through a heathy part of Epping Forest, I observed several specimens of this pretty little species, flying over and alighting on the common fern; not having any entomological apparatus with me except a couple of pill-boxes, I only secured two specimens. The next day I again visited the spot, but could not see a single individual." The insect has not been seen in Britain since!

The three species of this Family may be thus recognised:—

A. F.-w. with two oblique silvery white bands. *Bankia Bankiana.*

AA. F.-w. with no silvery white bands.

B. A white blotch at anal angle. *Erastria fuscula.*

BB. Basal half of the costa whitish. *Erastria venustula.*

Genus 1. Erastria.

Imago: antennæ filiform in both sexes; abdomen slender, crested; fore-wings with the lines and stig. distinct.

Larva smooth, slender, with only three pairs of ventral prolegs.

Pupa in a cocoon among leaves or moss.

E. venustula. 9‴. F.-w. whitish grey clouded with greenish grey; hind-margin tinted with rosy; lower half of the stig. edged with white; between them a black spot. VI & VII.

Larva unknown. (A description occurs in Treitschke, who doubts whether it belongs to the species.)

Epping Forest.

E. fuscula. 1″ 1‴—1″ 3‴. F.-w. brown; ren. st. whitish; orb. st. margined with whitish; between the stig. dark brown a large white blotch at anal angle, extending half-way to the costa. VI, VII.

Larva yellowish grey; dorsal line broad and brown; subdorsal line blackish and slender (*Gu.*) On bramble. VIII, IX.

Brg.! Brs. Ex.! Lw. St. Tn. Wr.

Genus 2. Bankia.

Imago · antennæ slightly pubescent in both sexes; abdomen slender, smooth, not crested; fore-wings with no stigmata and none of the usual lines.

Larva smooth, elongate, with two pairs of ventral prolegs and only the rudiments of a third pair.

Pupa in an oval cocoon on the surface of the earth.

B. Bankiana. 10‴—1″. F.-w. dull olive, with 2 slender, oblique, silvery white bands and a small white dash at the tip. VI.

Larva green, darker on the back and between the seg.; subdorsal and spiracular lines white (*Hub.*) On grasses. VIII?

Beachamwell, in Norfolk; Whittlesea Mere; Killarney.

Family III. ANTHOPHILIDÆ.

Imago small; antennæ short, simple; abdomen slender, smooth; fore-wings thick; in repose forming a very inclined roof.

Larva smooth, slender, with twelve or fourteen legs; feeding exposed on low plants.

Pupa in a slight cocoon amongst moss.

In this Family we have only two species, both day-flyers, one of which, *Hydrelia uncana*, frequents moist places in June, and occurs in several localities; the other, *Micra ostrina*, has only once occurred here, having been taken in Devonshire two-and-twenty years ago!

Genus 1. Hydrelia.

Imago: antennæ short, slightly pubescent in both sexes; fore-wings rounded at the tip.

Larva slender.

H. uncana. 11‴—1″. F.-w. brown, with a pale ochreous stripe along the costa, from which, beyond the middle, a tooth projects into the dark ground-colour; this tooth (and the costal stripe just before it) is margined with whitish; an ochreous-brown streak along the inner margin, and a whitish line towards the hind-margin. VI.

Larva green, slender, with a lateral stripe (*Treitschke*). On Carex. VIII?

Ca.! L.D. St. Y.

Genus 2. Micra.

Imago: antennæ short, slightly pubescent in the male; abdomen smooth; fore-wings pointed at the tip, with distinct lines, but no stigmata.

Larva with twelve legs, thick, pointed at each end.

Pupa short; in an oval cocoon spun amongst leaves or moss.

M. ostrina. 9‴. F.-w. whitish at the base; an irregular orange band across the middle; beyond is a brownish line or band, with some blackish streaks; it is edged externally with white: h.-w. whitish with an ochreous tinge, darker towards the hind-margin. VI.

Larva unknown.

One specimen near Bideford, in June, 1825.

Family IV. PHALÆNOIDÆ.

Imago: antennæ pubescent or ciliated; abdomen slender, not crested, coarsely hairy; fore-wings thick, with the usual lines and ren. st.; hind-wings brightly coloured (orange).

Larva smooth, elongate, with sixteen legs (but the two first

pairs of ventral prolegs are short, and useless in walking); feeding on trees.

Pupa enclosed in a slight cocoon amongst moss or bark.

This Family comprises but one genus, containing only three known species, two of which are British. They are among the earliest Noctuæ of the new year, appearing in forward seasons as early as the middle of March; they fly rather quickly in the bright sunshine; and *Brephos Parthenias*, the commoner species, is no rarity in birch woods; it should fall to the lot of the young collector his first season. *Brephos Notha* is less generally distributed.

Genus 1. Brephos.

The two species may be readily distinguished, because in *Parthenias* the antennæ of the male are only pubescent, whereas in *Notha* they have distinct pectinations. The pale band on the fore-wings of *Parthenias*, preceding the ren. st., is far more distinct than in *Notha*.

B. Parthenias. 1″ 3‴—1″ 6‴. F.-w. brownish, with a pale yellow costal blotch before the ren. st. (often continued across the wing as a pale band); a smaller pale yel-

low costal blotch beyond the el. l.: h.-w. orange, with the hind-margin black, and a broad dark grey patch along the inner margin, and dark grey central lunule. III, IV.

Larva dark green; dorsal and subdorsal lines black, edged with yellowish; spiracular line yellowish green; spots white; spiracles black (*Boisdv.*) On birch (sometimes oak and beech). VI, VII.

Brg.! Brs.! L.D. Lw. Sc. Sh.! Wt. Wr. Y.!

B. NOTHA. 1″ 3‴—1″ 4‴. F.-w. greyish brown, with an indistinct yellowish costal blotch beyond the el. l; there is hardly the indication of a pale blotch or band before the ren. st.: h.-w. orange, with blackish hind-margin, a large dark grey blotch along inner margin, and blackish central lunule; ANTENNÆ OF THE MALE WITH DISTINCT PECTINATIONS. III, IV.

Larva green; dorsal and subdorsal lines darker; spiracular line blackish green (*Boisdv.*) On aspen and sallow. VI.

Brg. K. Y.

We have now reached the end of the first main group of the NOCTUINA, the TRIFIDÆ; and we have now to consider the QUADRIFIDÆ, which have already been characterized at pp. 171, 172.

This group, as already mentioned (p. 171), is poorly represented in Europe, and we have only twenty-six British species, but these are divided amongst the four sections, VARIEGATÆ, INTRUSÆ, LIMBATÆ and SERPENTINÆ, which may be thus briefly characterized:—

VARIEGATÆ. Imago of moderate size; palpi well developed, often thick; WINGS ANGULATED OR WITH METALLIC BLOTCHES; hind-wings dull. Larva with twelve, fourteen or sixteen legs; feeding exposed.

INTRUSÆ. Imago of moderate or rather large size; ABDOMEN more or less FLATTENED; wings broad, dull.

Larva with sixteen legs; concealed by day among low plants.

Limbatæ. Imago of large size; wings broad, the HIND-WINGS GAILY COLOURED. Larva with sixteen legs, but looping the anterior segments when walking, elongate, FLATTENED BENEATH. Pupa often efflorescent.

Serpentinæ. Imago of moderate or small size; abdomen smooth, not flattened; wings thick and rather broad. Larva smooth, elongate, attenuated in front, WITH TWELVE OR FOURTEEN LEGS; feeding exposed.

Of the section Variegatæ only two Families are represented in Britain, the Plusidæ and the Gonopteridæ. The former, with us, comprises but two genera, containing eleven species; the latter contains only one European species, the well-known and abundant *Gonoptera libatrix*.

Of the Plusidæ many are very common; and the young collector will probably obtain both species of *Abrostola* (*Urticæ* and *Triplasia*) his first season, finding them sitting on palings by day, and flying in gardens at dusk. *Plusia Gamma* is a perfect plague almost everywhere, and seems to have discovered the secret of perpetual motion, as there is hardly an hour of the day or night when you may not find it actively on the wing. Now you see it swarming in a clover field, in the blaze of an August sun; now it is in troops at a Petunia bed, in the dusk of a September evening. *Chrysitis* is also an abundant species, and *Iota* and *Festucæ* are moderately common; *Bractea* and *Interrogationis* are northern species, occurring from Manchester to Perthshire; *Orichalcea* seems almost confined to the coast near Deal; *Pulchrina* is tolerably distributed, though not very common; but *Illustris* has not been met with for many years, though formerly, we are told, it occurred on Salisbury Plains.

Family I. PLUSIDÆ.

Imago: antennæ filiform; thorax with raised tufts; abdomen crested; fore-wings smooth, shining, often with metallic spots. Wings in repose forming a sloping roof.

Larva with twelve or sixteen legs, half-loopers, attenuated in front; the spots distinct, each bearing a bristle. Feeding exposed on shrubs or herbaceous plants.

Pupa in a silken cocoon, not subterranean.

The two genera may be thus distinguished:—

A. F.-w. not with metallic spots; the stig. margined by raised scales. Genus 1. ABROSTOLA.

AA. F.-w. with metallic spots (except in *Illustris*); the stig. not margined by raised scales. Genus 2. PLUSIA.

Genus 1. ABROSTOLA.

Imago: antennæ rather long, slender; thorax with a raised collar, and a bifid crest behind; fore-wings shining, without metallic spots.

Larva with sixteen legs, but the first pair of ventral prolegs ill-developed; the 12th seg. swollen or humped; loops in walking. Feeding on stinging-nettles.

Pupa in a cocoon of silk mixed with moss.

We have two species, thus recognised:—

A. F.-w. with the basal blotch and blotch at anal angle whitish grey. *A. Urticæ.*

AA. F.-w. with these blotches ochreous. *A. triplasia.*

A. URTICÆ (Spectacle). 1″ 2‴—1″ 5‴. F.-w. greyish brown; a large basal blotch WHITISH GREY, and a WHITISH GREY blotch at the anal angle; A BLACK APICAL STREAK, which is preceded by two short black lines before the subt. l. VI and VII.

Larva greenish white, with two or three oblique white streaks on each seg. beyond the fourth, the upper pair meeting on the back; spiracular line white (*Freyer*). On stinging-nettle. VII and X.

Brg.! Brs.! Bu. Ca. Ct.! Ed. Ex. Ha.! Hu. K. L.D. Lw. M. Pl. Sc.! St.! Wt. Wr. Y.

A. TRIPLASIA. 1″ 4‴—1″ 6‴. F.-w. greyish brown; a large basal blotch GREYISH OCHREOUS; a small GREYISH OCHREOUS blotch at the anal angle; two short black lines before the subt. l. near the costa, but NO black apical streak. VI, VII.

Larva dull green, with two white streaks along the back; 5th and 6th seg. rather swollen, each with a V-like mark pointing towards the head; 12th seg. with a dark green spot, encircled with white on the back; spiracular line white, with some oblique white streaks proceeding from it upwards (*Freyer*). On stinging-nettle. VII—IX.

Bi. Brs.! Bu. Ca. Ct.! Ex.! Ha.! Hu. K. M.! Wr. Y.

Genus 2. PLUSIA.

Imago: antennæ long and slender; thorax with a widely spread forked crest; abdomen crested; fore-wings shining, generally with metallic spots or blotched.

Larva with only twelve legs, no trace of the other two pairs, attenuated in front; feeding exposed on low plants.

Pupa in a loose silken cocoon.

We have nine species in this genus, which may be readily thus distinguished:—

A. F.w. with no metallic spots or blotches. *P. illustris.*
AA. F.-w. with large metallic blotches.
  B. A large brassy blotch beyond the middle. *P. orichalcea.*
  BB. A brassy band before and another beyond the middle. *P. chrysitis.*
AAA. F.-w. with small metallic blotches.
  C. One central blotch. *P. bractea.*

CC. Two central blotches and one near the apex. *P. Festucæ.*

AAAA. F.-w. with metallic letter-like spots.

D. F.-w. rosy grey. *P. Iota.*

DD. F.-w. purplish grey. *P. pulchrina.*

DDD. F.-w. violet-grey. *P. gamma.*

DDDD. F.-w. bluish grey. *P. interrogationis.*

P. ILLUSTRIS. 1″ 6‴—1″ 8‴. F.-w. greenish grey, with a rosy blotch on the inner margin before the i. l., and a slender rosy band beyond the el. l.; beyond this is a golden brown blotch at anal angle, in which terminate 2 whitish lines which are nearly parallel to the hind-margin. VII.

Larva pale green; dorsal line dark green; spiracular line yellowish; spots blackish (*Hub.*) On *Aconitum* and —? V.

Taken formerly on Salisbury Plains.

P. ORICHALCEA. 1″ 8‴—1″ 10‴. F.-w. brown, with a delicate purple tint; lower half of el. l. whitish; BEYOND THE REN. ST. TOWARDS THE COSTA IS A BRASSY GREEN BLOTCH REACHING TO THE SUBT. L.; below it is a golden brown blotch beyond the el. l. VIII.

Larva green; dorsal line white, edged with a wavy streak; spiracular line broad and white, edged above with dark green; spots white (*Treitschke*). On hemp-agrimony (*Eupatoria cannabinum*). VI, VII.

Deal. We are indebted to Mr. Harding for supplying our collections with this species.

P. CHRYSITIS (Burnished Brass). 1″ 4‴—1″ 6‴. F.-w. BRASSY GREEN, with the base and a central band (between the i. l. and el. l.) brown; the band is sometimes interrupted; hind-margin with a brownish tinge. VI—VIII.

Larva pale green; the subdorsal line represented by two rows of white streaks, and the spiracular line white (*Boisdv.*) On nettle, thistle, &c., &c. VI, VII and IX.

Common everywhere.

P. BRACTEA. 1″ 6‴—1″ 8‴. F.-w. purplish brown, with a large dark golden brown blotch on the middle of the

inner margin, reaching half-across the wing; IN IT AT ITS UPPER EDGE IS A CONSPICUOUS SILVERY BLOTCH. VII.

Larva very similar to that of *Iota* (*H. D. in litt.*)

Hu. L.D. M.! Sh. Y.

P. FESTUCÆ. 1″ 3‴—1″ 5‴. F.-w. golden brown, with some silvery yellowish blotches, 2 on the inner margin, 1 at the base of the costa and 1 at the apex; at the lower end of the latter is a pearly silvery streak, and TWO PEARLY SILVERY BLOTCHES LIE RATHER OBLIQUELY IN THE MIDDLE OF THE WING. VIII, IX.

Larva green; dorsal vessel dark green, with 3 slender pale green lines on each side; spiracular line pale green (*Dup.*) On reeds, *Carex*, *Sparganium*, and other marshy plants. VII.

Bi.! *Ca.!* Ed. L.D.! M. Wr. Y.

P. IOTA (Golden Y). 1″ 4‴—1″ 7‴. F.-w. ROSY grey, blotched with brown towards the hind-margin at the base and along the costa, and with a dark golden brown blotch on the middle of the inner margin, enclosing a small paler blotch toward the el. l.; the el. l. is HARDLY PERCEPTIBLY INDENTED below the middle; THE REN. ST. INDISTINCT; below the stig. are two pale golden spots, one V-like, the other round; sometimes they are united. VI and VII.

Larva pale green, with wavy yellowish white lines on each side of the back; spiracular line yellowish white (*Boisdv.*) On nettle, groundsel and honeysuckle. IV and VI.

Brs.! Bu.! Ct.! Da.! Ed. Ex. Ha.! Hu. K.! Lw. M.! Pl. Sc. Sh. St.! Tn. Tr.! Wa. Wr.

P. PULCHRINA. 1″ 3‴ — 1″ 6‴. F.-w. PURPLISH GREY, distinctly blotched or chequered with brownish; the 4 lines are all distinct; the el. l. IS VERY PERCEPTIBLY INDENTED below

the middle; THE REN. ST. DISTINCT; below the stig. are two silvery spots, one V-like, the other round. VI, VII.

Larva green, with the spiracular line yellow (*H. D. in litt.*) On nettles, groundsel, &c. V.

Brs. Bu.! Ca. Ct.! Da.! Ed. Ex.! Hu. K. Lw. M.! Sc. Sh. St. Wr.

P. GAMMA (Silver Y). 1″ 6‴—1″ 8‴. F.-w. VIOLET-grey clouded with dark grey; obliquely below the orb. st. is a silvery mark resembling the Greek letter γ, or a y, whence the name. VI—X.

Larva green; dorsal line bluish green, edged with slender white lines; above the subdorsal line is a pale whitish green line; spiracular line yellowish, edged above with dark green; spots whitish. On all sorts of low plants. IV and VII—IX.

Abundant everywhere.

P. INTERROGATIONIS, 1″ 3‴—1″ 5‴. F.-w. BLUISH grey clouded with dark grey, with a silvery white V-like mark below the orb. st., followed by (and sometimes united with) a silvery white round spot. VI, VII.

Larva green, with white markings (*Treitschke*). On stinging-nettle. V, VI.

Da. Hu. L.D. M.! Sh. Llangollen.

Family II. GONOPTERIDÆ.

Genus GONOPTERA.

Imago: antennæ short, ciliated in the male; thorax with raised collar; abdomen flattened and truncate in both sexes; fore-wings broad, angular and deeply indented.

Larva with sixteen legs, smooth; feeding exposed on the leaves at the end of branches of trees.

Pupa enclosed in a cocoon spun among the leaves on the tree.

The single species of this genus is well known for its hyber-

nating faculties and partiality to out-houses (the first specimen I met with was in Mr. Smart's Camera Obscura at Frant, near Tunbridge Wells); it is consequently frequently met with by incipients during the winter months, and may be found on the wing at the end of April and in May. From the larva feeding on willows, the perfect insect frequently shelters under the bridges over streams, where it is sometimes disturbed by a boating party.

G. Libatrix. 1″ 8‴—1″ 10‴. F.-w. reddish grey, with a large orange blotch at the base, and another between the whitish i. l. and el. l.; a white dot in the centre of the wing and 1 in the middle of the base. III h—VI h and VIII, IX.

Larva velvety green, with the incisions paler: subdorsal line yellow, edged beneath with black (*Gu.*) On willow. VII. Common everywhere.

Of the section INTRUSÆ (see *ante*, p. 302) all the three families are represented in Britain, but so poorly that we only number six species in this section altogether. Two species are generally abundant, *Mania typica* and *Amphipyra Tragopogonis*, and can hardly fail to fall into the collector's hands his first season; the latter is especially fond of creeping into houses and secreting itself in blinds, and when dislodged, if it falls on its belly or back, it shuffles along in a very peculiar manner, whence no doubt it has attained the name of "the Mouse." *Mania Maura* is also a common species, and has a peculiar, quiet, owl-like, flapping flight; it is commonly found in gardens, but is uneasy if boxed, and those unwise enough to leave one in a box all night will find there the next morning a mass of "fluff," and the personal appearance of the *M. Maura* much deteriorated. *Toxocampa pastinum* is a local insect, and not of general occurrence; it flies in the mid-day sunshine. *Amphipyra pyramidea* is common in many places, and comes freely to sugar; but how slyly it sidles away at the approach of the collector! *Stilbia anomala* has occurred in few localities; the greater number of specimens have been found in the New Forest, among heath.

Family I. AMPHIPYRIDÆ.

Imago of moderate or large size; abdomen much flattened.
Larva with sixteen legs, smooth, attenuated in front.
Pupa in a cocoon amongst leaves.

This Family comprises two genera, thus recognised:—

A. Abdomen much flattened; fore-wings with ren. st. indistinct. Genus 1. AMPHIPYRA.

AA. Abdomen not flattened; ren. st. of fore-wings distinct. Genus 2. MANIA.

Genus 1. AMPHIPYRA.

Imago: thorax smooth; abdomen smooth, flattened; wings shining, not dentate.

Larva thick, smooth, green, with distinct lines; feeding on trees or low plants.

Pupa in a cocoon on the surface of the ground.

We have two species, readily distinguished:—

A. F.-w. with i. l. and el. l. distinct; h.-w. coppery. *A. pyramidea.*

AA. F.-w. with i. l. and el. l. imperceptible; h.-w. pale brown. *A. Tragopogonis.*

A. PYRAMIDEA (Copper Underwing). 1″ 11‴—2″ 1‴. F.-w. brown, with a darker central band; the i. l. and el. l. pale brown; orb. st. dark brown, surrounded by a pale ring: h.-w. coppery, inclining to brown towards the costa. VII.

Larva green; the dorsal, subdorsal and spiracular lines white; the 12th seg. with a raised peak (*Hub.*) On oak, willow, elm, &c. V.

Brg.! Brs.! Bu. Ca. Ex.!! K. Lw.! M. Sh.! St. *Tn.* Wa. Wt. Wr. Y.

A. TRAGOPOGONIS (Mouse). 1″ 2‴—1″ 6‴. F.-w. dull brown, with a faint darker band before the el. l.; the orb. st. is represented by one blackish dot, and the ren. st. by two: h.-w. pale greyish brown. VII—IX.

Larva beautiful apple-green; the dorsal, subdorsal and spiracular lines pure white; there is no elevation on the 12th seg. (*Gu.*) On all sorts of low plants. VI.

Common everywhere; generally abundant.

Genus 2. Mania.

Imago: thorax crested; abdomen not flattened, sometimes crested; wings dentate or subdentate, rather shining.

Larva smooth, attenuated gradually in front; feeding on low plants; concealed by day.

Pupa subterranean.

The size and colour of the two (rather discordant) species which compose this genus render it impossible to confound them; besides, the *crested* abdomen and *toothed* wings belong only to *M. Maura*.

M. typica. 1″ 6‴—1″ 8‴. F.-w. brown marbled with dark brown; the lines paler; the veins and margins of stig. whitish ochreous: h.-w. dark grey. VI.

Larva greenish grey, with a faint rosy tint in the incisions; a row of oblique whitish streaks intersect the dark grey subdorsal line, and those on the 11th or 12th seg. are followed by a black streak; spiracular line whitish, edged above with blackish (*Dup.*) On dock, willow-herb, &c. IX—IV. (When young the larva is quite gregarious, and almost defoliates the plant on which it occurs).

Common everywhere.

There is a superficial resemblance between this insect and *Heliophobus popularis* and *Neuria Saponariæ*. From both it may be distinguished by its dark hind-wings.

M. Maura. 2″ 5‴—2″ 7‴. F.-w. blackish brown; a black spot between the stig., 1 before and another beyond them, and below them is a large black blotch occupying the space between the i. l. and el. l. and reaching to the inner margin. VII, VIII.

Larva purplish brown, darker on the sides; dorsal line yellowish; subdorsal indistinct, yellowish, intersected by oblique whitish streaks, edged behind with black; spiracular line whitish (*Dup.*) On dock, chickweed, &c. IV, V.

Common everywhere.

Family II. TOXOCAMPIDÆ.

Genus Toxocampa.

Imago of moderate size; thorax smooth, with raised dark-coloured collar; abdomen smooth, rather flattened; wings not dentate, the fore-wings with distinct blackish ren. st.

Larva smooth, elongate, attenuated at each end, with sixteen legs, the first two pairs of ventral prolegs rather short.

Pupa in a cocoon.

We have only one species.

T. pastinum (Black-neck). 1″ 7‴—1″ 9‴. F.-w. grey, with numerous short transverse streaks; an indistinct brownish grey band beyond the el. l.; a black dot represents the orb. st., and a rather narrow black crescent the ren. st.; from its lower end are frequently two short black streaks; front of the thorax and back of the head blackish. VI.

Larva greyish, darker on the back, and dotted with black; the dorsal, subdorsal and spiracular lines whitish, edged with yellowish orange (*Gu.*) On *Vicia Cracca*. V.

Brg. Lw. Ly. Sc.!! St. Tn. Y.

Family III. STILBIDÆ.

Genus Stilbia.

Imago: thorax smooth; abdomen long, smooth (slender in the male); fore-wings narrow, the stig. distinct; in repose the fore-wings partly overlap, and form a very inclined roof.

Larva smooth, cylindrical, thick, with sixteen legs; feeding on grasses during the winter.

Pupa subterranean.

This peculiar genus consists at present of only a single species. It forms one of those abnormal genera which cannot be introduced satisfactorily anywhere.

S. ANOMALA. 1″ 1‴—1″ 5‴. F.-w. dark grey, paler towards the inner margin; both the stig. pale grey; the orb. st. oblong and obliquely placed: h.-w. whitish grey. VIII, IX.

Larva green or reddish grey, with the dorsal and subdorsal lines slender, yellowish white; the spiracular line broad and white (*Graslin*). On grasses. I, II.

L.D. Ly. M. Pm.

Of the section LIMBATÆ (see *ante*, p. 303) only one genus (CATOCALA), in the Family CATOCALIDÆ, is here represented. The name of the genus signifies "beautiful beneath," because the perfect insects, when at rest, forming a flat grey triangle, have no peculiar beauty to boast of; but when the hind-wings, which are either red or greyish blue, are exposed to view, we at once alter our opinion as to the beauty of the insect.

The Red Underwing (*Catocala Nupta*) is common in the South of England, and in August and September may frequently be observed flying by day in the neighbourhood of willows: on such occasions the uninitiated are apt to take it for a butterfly. This will no doubt be the first of the genus the young collector meets with. The Crimson Underwings (*C. sponsa* and *promissa*) are local species, but common in the New Forest, where they are obtained rather freely by sugar. *C. Fraxini* is a great rarity, but appears to occur further North than the common *Nupta*.

Genus CATOCALA.

Imago of large size; antennæ long, slender, pubescent in the male; thorax slightly crested; abdomen long, conical,

slightly crested: wings broad, thick: the hind-wings gaily coloured. In repose the wings form a very flat roof.

Larva elongate, beneath flattened and spotted with black, attenuated at each end, with fleshy filaments on the sides above the legs: head flattened (with the face obliquely placed) and rather forked at the top. Feeding on trees, and resting attached to the trunks.

Pupa covered with a bluish efflorescence, enclosed in a slight cocoon of silk, spun amongst leaves or bark.

The four species may be thus recognised:—

A. H.-w. bluish grey. *C. Fraxini.*
AA. H.-w. red. *C. Nupta.*
AAA. H.-w. crimson.
B. Central band of h.-w. slender and slightly sinuous. *C. promissa.*
BB. Central band of h.-w. broad and much indented. *C. sponsa.*

C. Fraxini (Clifden Nonpareil). 3″ 9‴—4″. F.-w. pale grey dusted with dark grey; the i. l. and el. l. dark grey; ren. st. grey, with dark outline; below it is a pale blotch: h.-w. dark greyish black, with a pale greyish BLUE band beyond the middle. VIII e—IX.

Larva greyish dusted with black; a small hump on the 9th and another on the 12th seg.; belly whitish; prolegs pinkish white (*Sepp.*) On poplar, aspen and ash. VII.

Brg. Bu. M. Wt.

C. Nupta (Red Underwing). 2″ 11‴—3″ 1‴. F.-w. grey, with dark grey i. l., el. l., cen. sh. and ren. st.; the latter is preceded by a pale blotch; the orb. st. is not represented: h.-w. RED, with broad black border, and a BROAD though much indented central black band. VII, VIII.

Larva greenish grey, with a double, wavy, whitish line on the back; subdorsal line whitish, and slight rosy humps across the 5th to 12th seg. (*Sepp.*) On willows and poplars. V, VI.

Brg.! Brs.! Ca.!! Ct. Ex. K. Lw. Ly. Tn. Wa. Wr.

C. PROMISSA. 2″ 1‴—2″ 3‴. F.-w. WHITISH grey, with the i. l. and el. l. black, THE FORMER DOUBLE AND VERY DISTINCT, followed by a pale band; the subt. l. well-defined and MUCH INDENTED; the orb. st. is not represented: h.-w. CRIMSON, with a broad black border, and SLENDER SLIGHTLY SINUOUS central black band. VII.

Larva bluish white, with an irregular black line above the spiracles, and a black X-like mark on each side of the back, on the 6th to 11th seg. (*Hub.*) On oak. V, VI.

Brg. Lw. Ly. Pm.

C. SPONSA. 2″ 4‴—2″ 7‴. F.-w. YELLOWISH grey, WITH A PALE CENTRAL BLOTCH INCLUDING THE ORB. ST. (very ill-defined), the ren. st. and a spot beneath them; the i. l., el. l. and subt. l. blackish, the latter NOT deeply indented: h.-w. CRIMSON, with broad black hind-margin, and SLENDER central black band, MUCH INDENTED, almost forming a W. VII, VIII.

Larva dull green; dorsal line purplish, a row of whitish spots on each side; spiracular line ochreous; an ochreous hump on the 9th seg. (*Hub.*) On oak. VI.

Brg. Lw. Ly.

Of the section SERPENTINÆ (see *ante*, p. 303), three families, each comprising a single genus, are represented in Britain. We have, indeed, only four species in the section, one of which, *Ophiodes lunaris*, has occurred but once, in Hampshire; *Euclidia Mi* is common in meadows, and *Phytometra ænea* on heaths, and probably both will fall to the lot of the collector his first season. *Euclidia glyphica* appears more partial to woods, and is less generally distributed than its congener, but is far from rare.

Family I. OPHIUSIDÆ.

Genus OPHIODES.

Imago: thorax robust; the collar raised; abdomen smooth, rather flattened; wings thick, with distinct lines and stigmata.

Larva elongate, flattened beneath, with a forked tubercle on the 12th segment, with sixteen legs, the two first pair of prolegs a little shorter than the others.

Pupa thick, efflorescent, enclosed in a rough cocoon amongst leaves.

O. LUNARIS. 2″ 2‴—2″ 3‴. F.-w. grey; the veins paler; i. l. and el. l. pale ochreous, edged externally with orange; subt. l. pale ochreous; orb. st. represented by a brown dot; ren. st. ochreous-brown: h.-w. pale ochreous-brown (*Sepp.*) V.

Larva brownish grey; spiracular line reddish brown; two black spots, edged with red, on the back of the 6th seg.; fork of the 12th seg. red (*Sepp.*) On oak. VII.

One taken in Hampshire, by Captain Chawner.

Family II. EUCLIDIDÆ.

Genus Euclidia.

Imago of rather small size; antennæ short, pubescent in the male; thorax short, smooth; abdomen short, with a slight crest; wings thick, with distinct lines and stigmata.

Larva smooth, elongate, with twelve legs, in repose coiling up the anterior segments; feeding exposed on low plants.

Pupa enclosed in a cocoon amongst moss.

We have two species, readily distinguished by the characters emphasised.

E. Mi. 1″ 2‴—1″ 3‴. F.-w. dark brown; the i. l., el. l. and subt. l. pale ochreous; THE EL. L. MAKES AN EXTRAORDINARY INDENTATION AND MEETS THE I. L. ON THE INNER MARGIN; orb. st. black; ren. st. brown, edged with black towards the base, and externally with pale ochreous: h.-w. blackish, clouded with ochreous towards the base, with a central PALE OCHREOUS band and submarginal spots. VI.

Larva pale violet, with pale yellow spiracular line; head with a black spot (*Hub.*) On clover, &c. V.

Common everywhere.

E. GLYPHICA. 1″ 2‴—1″ 3‴. F.-w. purplish grey tinged with ochreous; the i. l. followed and the el. l. preceded by a dark brownish band; in the latter the ren. st. is concealed; a dark brownish blotch on the costa beyond the el. l.; THE EL. L. ONLY SLIGHTLY INDENTED, AND REACHING THE INNER MARGIN FAR FROM THE I. L.: h.-w. DULL ORANGE, clouded with black towards the base, and with a black wavy streak from the anal angle. VI.

Larva dull ochreous, beneath brownish; spiracular line whitish; head brown (*Hub.*) V.
Brg.! Brs.! Ca.! Ct.! Da.! Ex. Hu.!! Ha. K.! L.D. Lw. Ly. M.! Pl. Sc.! Sh. St. Tn. Wa. Wr. Y.!

Family III. POAPHILIDÆ.

Genus Phytometra.

Imago of small size; antennæ short, slender; abdomen very slender, smooth: wings short, rather slender; the fore-wings with indistinct lines, but no spots.
Larva unknown.

P. ænea. $8\frac{1}{2}'''$—$9'''$. F.-w. dull green, with an indistinct reddish band beyond the middle, and the hind-margin also reddish. VI, VII.
Larva unknown.
Brg.! Brs.! Bu. Ca.! Ct.! Da.! Ed. Ex.! Ha.! Hu. K.! L.D.! Lw.! Ly.! M. Sc. Sh.! Tn. Wa. Wr. Y.!

With this species we conclude the Noctuina, a Family of no inconsiderable extent, as may be seen from the fact of our having in this country very nearly 300 different species. From the number and great similarity of the species, this group must always present considerable difficulty to the beginner; but he must console himself with the reflection, that the greater the difficulty he overcomes the more honourable is his position, or, as it is more pithily expressed in Latin,

Quo plus difficultate, eo plus honore.

Were there no difficulties whatever, the study would lose many of its advantages as an intellectual training, and in the eyes of many it would also lose much of its charms.

APPENDIX I.

LIST OF BRITISH LEPIDOPTERA,

WITH THE NAMES USED BY DOUBLEDAY (IN HIS 'SYNONYMIC LIST OF BRITISH LEPIDOPTERA') AND STEPHENS (IN HIS BRITISH MUSEUM 'CATALOGUE OF BRITISH LEPIDOPTERA') GIVEN AS SYNONYMS.

The names printed in Capitals and Small Capitals are those used in the 'Manual' (the number *following* each species refers to the page where the description will be found; the numbers *preceding* the names of the species are merely consecutive numbers); the names printed in Roman are those used by Doubleday, and those printed in *Italics* are those used by Stephens. Whenever a synonym is not given for a species, it appears in Doubleday or Stephens under the same name, or else it is not in their lists at all.

LEPIDOPTERA.

Rhopalocera.

PAPILIONIDÆ

Papilionidi

PAPILIO
1 Machaon, 15

Pieridi

GONEPTERYX
2 Rhamni, 16

COLIAS
3 Edusa, 16
4 Hyale, 17

APORIA
5 Cratægi, 18
Pieris Cratægi
PIERIS
6 Brassicæ, 18
7 Rapæ, 18
8 Napi, 19
9 Daplidice, 19
ANTHOCHARIS
10 Cardamines, 20
Euchloe Cardamines
LEUCOPHASIA
11 Sinapis, 20

NYMPHALIDÆ
Satyridi
ARGE
12 Galathea, 26
LASIOMMATA
13 Ægeria, 27
Satyrus Ægeria
LASIOMMATA
14 Megærà, 27
Satyrus Megæra
HIPPARCHIA
15 Semele, 28
Satyrus Semele
16 Janira, 28
Satyrus Janira
17 Tithonus, 28
Satyrus Tithonus
18 Hyperanthus, 28
Satyrus Hyperanthus
Enodia Hyperanthus
EREBIA
19 Blandina, 29
20 Cassiope, 29
CŒNONYMPHA
21 Davus, 32
Satyrus Davus
22 Pamphilus, 32
Satyrus Pamphilus

Nymphalidi
LIMENITIS
23 Sibilla, 33
APATURA
24 Iris, 34

Vanessidi
CYNTHIA
25 Cardui, 37
Vanessa Cardui
VANESSA
26 Atalanta, 38
27 Io, 38
28 Antiopa, 38
29 Polychloros, 39
30 Urticæ, 39
GRAPTA
31 C-album, 40
Vanessa C-album

Argynnidi
ARGYNNIS
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33 Adippe, 42
34 Aglaia, 42
35 Lathonia, 42
36 Selene, 43
37 Euphrosyne, 43
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39 Athalia, 47
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49 CHRYSEIS, 55 or 56
POLYOMMATUS
50 ARGIOLUS, 57 or 58
51 ALSUS, 57 or 58
52 ACIS, 58
53 ARION, 58 or 59
54 CORYDON, 59 or 60
55 ADONIS, 59 or 60
56 ALEXIS, 60 or 61
57 ÆGON, 60 or 61
58 AGESTIS, 61
59 ARTAXERXES, 61 or 62

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Syrichthus Alveolus
Pyrgus Alveolus
THANAOS
61 TAGES, 65 or 66
Nisoniades Tages
STEROPES
62 PANISCUS, 66
Cyclopides Paniscus
PAMPHILA
63 ACTÆON, 67
64 LINEA, 68
65 SYLVANUS, 68 or 69
66 COMMA, 69

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69 MINOS, 80
70 TRIFOLII, 80
71 LONICERÆ, 81
72 FILIPENDULÆ, 81

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73 OCELLATUS, 87
74 POPULI, 87
75 TILIÆ, 87
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76 ATROPOS, 88
SPHINX
77 CONVOLVULI, 81
78 LIGUSTRI, 90
79 PINASTRI, 90
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80 EUPHORBIÆ, 92
81 GALII, 94
82 LIVORNICA, 94
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83 NERII, 95
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84 CELERIO, 96
85 ELPENOR, 96
86 PORCELLUS, 97

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98 Allantiforme, 105
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102 Formicæforme, 106

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Notodonta Chaonia

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127 Cucullina, 124
Notodonta Cucullina
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Notodonta Carmelita

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APPENDIX II.

The following Latin names of Plants occurring in the volume, their English names are here appended.

Aconitum	Monk's Hood
Aira cæspitosa	Turfy Hair Grass
,, *canescens*	Grey Hair Grass
Alnus glutinosa	Alder
Alsine media	Common Chickweed
Anthemis	Chamomile
Arctium Lappa	Burdock
Arenaria	Sand-wort
Artemisia	Wormwood
,, *campestris*	Field Southernwood
,, *maritima*	Sea Wormwood
Arundo Phragmites	Common Reed
Astragalus	Milk Vetch
Atriplex	Orache
Betula alba	Birch
Brassica Napus	Rape
Briza	Quaking Grass
Calluna vulgaris	Ling; Heather
Campanula rotundifolia	Harebell
Cardamine impatiens	Bitter Cress

Carduus acanthoides	Welted Thistle
,, *lanceolatus*	Spear Plume Thistle
,, *nutans*	Musk Thistle
Carex	Sedge
Cerastium arvense	Mouse-ear
Chenopodium	Goose-foot
Cladium Mariscus	Common Sedge
Convolvulus	Bindweed
,, *arvensis*	Small Bindweed
Cynosurus cristatus	Crested Dog's-tail Grass
Daucus Carota	Wild Carrot
Delphinium	Larkspur
Digitalis purpurea	Foxglove
Epilobium	Willow Herb
Eriophorum	Cotton Grass
Erodium cicutarium	Stork's-bill
Eupatorium cannabinum	Hemp Agrimony
Euphorbia Cyparissias	Cypress Spurge
,, *Esula*	Leafy-branched Spurge
,, *Paralias*	Sea Spurge
Festuca duriuscula	Hard Fescue Grass
Galium Mollugo	White Bedstraw
,, *verum*	Yellow Bedstraw
Glyceria fluitans	Floating Sweet Grass
Hedera Helix	Ivy
Helianthemum vulgare	Common Rock Rose
Hippocrepis comosa	Horse-shoe Vetch
Hippophae Rhamnoides	Sea Buckthorn
Hyoscyamus	Henbane
Hypericum	St. John's-wort
Ilex Europæus	Holly
Impatiens noli-me-tangere	Yellow Balsam
Iris Pseudacorus	Yellow Flag
Lathyrus	Vetchling
Ligustrum vulgare	Privet
Linaria vulgaris	Common Yellow Toadflax
Lonicera periclymenum	Woodbine ; Honeysuckle
Lotus corniculatus	Bird's-foot Trefoil
Luzula	Wood Rush
Lychnis dioica	Red Campion

Lychnis Flos-cuculi	Ragged Robin
Matricaria	Wild Chamomile
Milium effusum	Millet Grass
Myosotis arvensis	Field Scorpion Grass
Myrica Gale	Sweet Gale
Nerium Oleander	Oleander. (A greenhouse plant)
Orobus	Bitter Vetch
Persicaria (Polygonum)	Spotted Persicaria
Peucedanum palustre	Hog's Fennel; Milk Parsley
Phleum pratense	Cat's-tail Grass
Plantago lanceolata	Ribwort Plantain
„ *major*	Greater Plantain
„ *maritima*	Sea Plantain
Poa annua	Annual Meadow Grass
„ *aquatica*	Reed Meadow Grass
„ *pratensis*	Smooth-stalked Meadow Grass
Populus nigra	Black Poplar
„ *tremula*	Aspen
Primula vulgaris	Primrose
Prunus spinosa	Sloe; Blackthorn
Pteris aquilina	Common Fern
Reseda lutea	Wild Mignonette
„ *luteola*	Weld
Rhamnus catharticus	Buckthorn
„ *Frangula*	Alder Buckthorn
Rubus Idæus	Raspberry
Rumex acetosa	Sorrel
„ *aquaticus*	Water Dock
„ *hydrolapathum*	Great Water Dock
Salix alba	Willow
„ *caprea*	Sallow
„ *triandra*, „ *viminalis*	Osier
Scabiosa arvensis	Field Scabious
„ *succisa*	Devil's-bit Scabious
Scirpus	Club Rush
Scrophularia	Fig-wort
„ *aquatica*	Water Betony
„ *nodosa*	Knotted Figwort

Senecia Jacobæa	Ragwort
Silene	Catchfly
„ *inflata*	Bladder Campion
„ *nutans*	Nottingham Catchfly
Solidago virgaurea	Golden Rod
Sonchus arvensis	Corn Sow Thistle
„ *oleraceus*	Common Sow Thistle
Sparganium	Bur Reed
Teucrium Scorodonia	Wood Sage
Trifolium montanum	Mountain Trefoil
„ *procumbens*	Hop Trefoil
Triticum repens	Couch Grass
Trollius Europæus	Globe Flower
Tropæolum	Indian Cress (a garden plant), often improperly called Nasturtium
Turritis glabra	Tower-wort
Tussilago Petasites	Butter Bur
Typha latifolia	Reed Mace
Ulmus campestris	Elm
Urtica dioica	Stinging Nettle
Vaccinium Myrtillus	Bilberry
Verbascum	Mullein
„ *Blattaria*	Moth Mullein
„ *Lychnitis*	White Mullein
Vicia cracca	Tufted Vetch
Viola canina	Dog Violet
„ *odorata*	Sweet Violet
„ *tricolor*	Wild Heart's-ease

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